Arlington Conservation Commission

Date: Thursday, January 7, 2021
Time: 7:30 PM
Location: Conducted by Remote Participation

Please note: The listing of matters are those reasonably anticipated which may be discussed at the meeting. Not all items listed may in fact be discussed and other items not listed may be brought up for discussion to the extent permitted by law.

Agenda

1. Administrative

   a. In accordance with the Governor's Order Suspending Certain Provisions of the Open Meeting Law, G. L. c. 30A, § 20 relating to the COVID-19 emergency, the January 7, 2021 public meeting of the Arlington Conservation Commission shall be physically closed to the public to avoid group congregation. The meeting shall instead be held virtually using Zoom.

   Topic: Conservation Commission Meeting
   Time: January 7, 2021 07:30 PM Eastern Time (US and Canada)

   Register in advance for this meeting:
   https://town-arlington-ma-us.zoom.us/meeting/register/tJEpcuCvqzMiH9Ewibvnx82ZXRBdNGuPB0Jg

   Members of the public are strongly encouraged to send written comment regarding any of the hearings listed below to Conservation Agent Emily Sullivan at esullivan@town.arlington.ma.us.

   Please read Governor Baker's Executive Order Suspending Certain Provision of Open Meeting Law for more information regarding virtual public hearings and meetings: https://www.mass.gov/doc/open-meeting-law-order-march-12- 2020/download

   b. Review draft 12/03/2020 minutes.

   c. Review draft 12/17/2020 minutes.

   d. Review draft 2020 annual report.

   e. Update on ZBA 1/5/2021 hearing on 1165R Mass Ave Comprehensive Permit.

2. Discussion

   a. Discussion on proposed Warrant Article: Zoning Bylaw Amendment/Allow cemetery use in the open space district

3. Hearings

   Notice of Intent

Notice of Intent: Arlington Reservoir Master Plan Phase 2, 210 Lowell Street
Continued Hearing
MassDEP File #091-0327

7:45pm	This project consists of the second phase of implementation of the Arlington Reservoir Master Plan and includes the following activities: parking area and stormwater improvements; improvements to existing pathways to make them accessible under the Americans with Disabilities Act (ADA); renovation and addition of new recreational facilities; shoreline bank stabilization; and upland habitat restoration and invasive species removal. Proposed project work is within the 100-ft Wetlands Buffer and Inland Bank area of the Arlington Reservoir. This project was first presented to the Commission at its 12/17/2020 meeting.

Request for Determination of Applicability

Request for Determination of Applicability: 59 Lowell Street
Arlington File #A21.1

8:30pm	The project proposes to construct an above-ground exercise swim spa partially within the Wetlands 100-ft Buffer and Adjacent Upload Resource Area (AURA) of No Name Brook.

Town of Arlington, Massachusetts

Review draft 12/03/2020 minutes

Summary:
Review draft 12/03/2020 minutes.

ATTACHMENTS:

	Type	File Name	Description
🗋	Minutes	12032020_Minutes_Conservation_Commission.pdf	Draft 12/03/2020 Minutes

Arlington Conservation Commission

Date: December 3, 2020
Time: 7:30pm
Location: Conducted through Remote Participation using Zoom

Minutes
Attendance: Commission Members Susan Chapnick (Chair), Mike Gildesgame, Pam Heidell, Dave Kaplan, Nathaniel Stevens, Chuck Tirone (Vice Chair), and David White; Associate Commissioners Cathy Garnett and Doug Kilgour; and Conservation Agent Emily Sullivan. Representatives for the DPW NOI hearing included: Mike Rademacher (DPW), Jeff Alberti (Weston & Sampson), and Elena Compter (Weston & Sampson). Representatives for the Thorndike Place Working Session included: John Hession (BSC), Tood Undzis (BETA), Julia Stearns (BETA), Stephanie Kiefer (Smolak & Vaughn), Gwen Noyes (Oak Tree Development), Arthur Klipfel (Oak Tree Development), and Christian Klein (ZBA). Members of the public included: Adrienne Landry, Ann LeRoyer, Brian Rehrig, Dan Swanson, Mara Vatz, Patrick Hanlon, Tome Mason, Chris Vrotsos, Steve Revilak, Marina Popova, Mary Ellen Aronow, Kimberley Conant, Nancy Gray, Andy Forbes, David Barlow, Jennifer Griffith, Marci Shapiro-Ide, and Barbara Rowland.

11/19/2020 Meeting Minutes
The Commission discussed edits to the draft 11/19/2020 minutes. D. White motioned to approve the minutes as edited, P. Heidell seconded, all were in favor, motion approved. A roll call vote was taken. S Chapnick voted yes, M. Gildesgame voted yes, P. Heidell voted yes, D. Kaplan voted yes, C. Tirone voted yes, and D. White voted yes. N. Stevens had not yet joined the meeting.

General Updates
D. White updated the Commission that the DPW yard rezoning and capital requests had been passed at the recent Special Town Meeting.

Notice of Intent: 51 Grove Street, Arlington Department of Public Works
MassDEP File #091-0326
Documents Reviewed:
1) *DPW Facility 51Grove Street NOI, prepared by Weston & Sampson, dated October 22, 2020*
2) *Arlington Town Yard Facility 51 Grove Street NOI Plan Set, prepared by Weston & Sampson, dated October 21, 2020*
3) *Supplemental Materials for DPW Facility NOI, prepared by Weston & Sampson, dated 11242020*

Resource Areas:

1) *100-ft Wetlands Buffer*
2) *Adjacent Upland Resource Area*
3) *200-ft Riverfront Area*
4) *Floodplain and Floodway*
5) *Mill Brook*

This project proposes a new/renovated Municipal Facility to support the Department of Public Works (DPW), Inspectional Services Department (ISD), Facilities, and IT departments at 51 Grove Street. The proposed site includes the current 4.4-acre parcel, used by DPW / ISD, and an adjacent 1.4-acre portion of Town-owned land for a total of 5.8 acres. The site has Activity and Use Limitations (AUL) as defined by MassDEP due to site contamination, and therefore has contact barriers and engineered barriers (mostly pavement) per MassDEP requirements to prevent exposure to underlying contaminated soil. Sections of the site are within the 100-ft Wetlands Buffer, AURA, and 200-ft Riverfront Area of Mill Brook, as well as floodway and floodplain.

The Conservation Commission had a working session for this project proposal during its August 20, 2020 meeting. The public hearing for this NOI began at the Commission’s November 5, 2020 meeting. During the November 5, 2020 meeting, the Commission requested the following supplemental materials:

1) Stormwater: on sheet c-6 0-3, replace stormwater unit 4 with catch basin
2) Stormwater: consider proprietary separator/treatment unit between Building D and berm where existing stormwater system is
3) Stormwater: consider adding canopy to materials storage area
4) Stormwater: consider grading materials storage area so sheet flow does not enter stormwater system
5) Vegetation: reconsider proposed ash trees, or develop management plan
6) Stormwater: update stormwater calculations with NOAA Atlas 14 Plus
7) Stormwater: update stormwater calculations with NOAA Atlas 14 Plus Plus
8) Stormwater: update specification language
9) Impervious Area: breakout impervious surfaces calculations into 200-ft Riverfront Area and 100-ft Wetlands AURA/Buffer
10) Stormwater: consider making the 80% TSS reduction in new impervious area a 90% TSS reduction
11) Amenities: consider opportunities for educational signage regarding stormwater improvements
12) Vegetation: strengthen statements of vegetation survivability, replacement, and maintenance; consider longer maintenance period than three years
13) Vegetation: include invasive management plan
14) Stormwater: consider increasing the proposed 44% TSS reduction in existing impervious area

Jeff Alberti from Weston & Sampson presented the supplemental materials and subsequent changes made since the November 5, 2020 hearing. The changes included:

- The Grading and Drainage Plan (sheet C-603) had been revised as requested by the Commission. A new catch basin is proposed in place of previously shown SWTU-4, and water quality unit was instead moved downstream of catch basin.
- The Grading and Drainage Plan (Sheet 603) had been revised as requested by the Commission. A new water quality unit had been added on the downstream of the existing drainage network, prior to discharging into Mill Brook.
- One Ash tree previously proposed on site had been replaced with a Hackberry tree (Celtis Occidentalis) as a more resilient alternative.
- HydroCAD model has been updated with NOAA Atlas 14 Plus Plus rainfall depths. Revised comparison table and HydroCAD analysis was provided. An analysis using NOAA Atlas 12 Plus rainfall depths had also been completed, and rainfall comparison table was provided as well. The following rainfall depths were used for NOAA Plus and NOAA Plus Plus rainfall:

	NOAA+ Rainfall (in)	NOAA++Rainfall (in)
2 – Year Storm	3.63	4.04
10 – Year Storm	5.79	6.43
25 – Year Storm	7.49	8.32
50 – Year Storm	8.72	9.69
100 – Year Storm	10.45	11.5

- Educational signage will be developed and displayed in the areas of proposed rain gardens showcasing LID measures implemented on site.
- The typical warranty period for new plantings is one year. Project specifications were revised to increase this warranty period to two years. After the warranty period, the DPW will be responsible for evaluating the health of the landscape areas each planting season, in the spring and the fall. Any unhealthy plantings identified by the DPW will be evaluated and replaced if necessary.
- The initially proposed 44% TSS reduction was able to increase to 47%, however due to the physical and environmental constraints of the site, a higher reduction rate was not feasible.

This project proposes high reflectance roofs on the buildings to mitigate for heat island effects. The proposed plantings and trees are also to mitigate for heat island effects.

D. Kaplan asked whether the NOAA+ and NOAA++ analysis changed the sizing of the proposed stormwater system. E. Compter stated that the additional NOAA+ and NOAA++ analysis did not change the sizing or redesign the stormwater system. The system was designed to manage a 25-year storm. D. Kaplan asked whether there was capacity onsite to enlarge the stormwater system. J. Alberti stated the system could not be enlarged because of the contaminated site and barrier, and constraints from the high pressure gas main onsite.

P. Heidell asked whether the stormwater system could be sized larger than the 25-year storm due to climate change impacts on increased precipitation. E. Compter stated that

Arlington requires a 25-year storm capacity and that a larger capacity would be cost prohibitive.

S. Chapnick asked for clarification on the proposed invasive removal method and whether the project was proposing to remove trees and grind down tree stumps.

C. Garnett stated that stump grinding was not necessary unless the stumps were hazardous or in a high traffic area. C. Garnett recommended permitting the same invasive management methods that were permitted in the AHS permit, which included the cut-and-dab method.

P. Heidell motioned to close the public hearing for 51 Grove Street, DPW Facility Renovation MassDEP File #091-0326, D. Kaplan seconded, all were in favor, motion approved. A roll call vote was taken. S Chapnick voted yes, M. Gildesgame voted yes, P. Heidell voted yes, D. Kaplan voted yes, C. Tirone voted yes, and D. White voted yes. N. Stevens had not yet joined the meeting.

The Commission discussed possible conditions and asked E. Sullivan to draft a permit for the Commission to deliberate during its December 17, 2020 meeting.

Thorndike Place Working Session

The Conservation Commission met with the Thorndike Place Applicant’s Engineer (BSC Group) and the Town’s Third-Party Reviewer (BETA) to review updated application materials related to wetland resources and stormwater in advance of the Zoning Board of Appeals’ 12/10/2020 hearing. These updated materials included:

- Report on Existing Conditions (Section 3.2.6 of Arlington Comprehensive Permit Regulations)
- Architectural Drawings
    - 3D Perspective View (1 sheet)
    - Floor Plans (4 sheets) - Garage, Ground Floor, Typical 2nd/3rd, and 4th Floor
    - Exterior Elevations (3 sheets) showing all building sides with Material Legend and Type of Construction
    - Courtyard Section (1 sheet)
- Site Plans revised November 3, 2020 reflecting new building program presented at the October 13, 2020 public hearing
- Stormwater Report
- Wildlife Habitat and Vegetation Evaluation
- Updated wetlands delineation dated October 2020
- Updated waiver request list
- Statement of Compliance with Arlington’s Master Plan, Housing Production Plan, and Open Space and Recreation Plan.

D. White recused himself from the working session.

S. Chapnick presented opening remarks about the process of the 40B Comprehensive Permit review under the ZBA and the roles of the ZBA and other Town permitting boards, including the Conservation Commission. S. Chapnick clarified that this is a Thorndike Place Working Session, not a public hearing, and the goal is to discuss changes to the project since the Commission's October 1, 2020 working session. She noted that while there will be an opportunity for the public to provide feedback directly to the Conservation Commission at the end of the working session, members of the public are encouraged to send comments directly to the ZBA.

The Applicant's Representative J. Hession presented the updated project proposal, comparing the September 2020 proposal to the November 2020 proposal. These changes included an updated wetlands delineation which found that the two Isolated Vegetated Wetlands were no longer resource areas. The project also proposes 2:1 compensatory flood storage outside of resource areas.

The Town's Third-Party Reviewer, BETA, summarized their review of the Applicant's updated comprehensive permit application. T. Undzis, BETA's civil engineer, reviewed the proposed stormwater system and stated that the roof system did not include all pertinent information needed for a complete review. T. Undzis stated that the 2:1 compensatory flood storage proposal looked accurate.

J. Stearns, BETA's wetlands specialist, stated that the wetlands delineation looked accurate. J. Stearns stated that the two areas identified as Isolated Vegetated Wetlands in the past currently did not meet the definition of Isolated Vegetated Wetlands due to lack of hydrologic characteristics and absence of wetlands vegetation. BETA did not conduct a subsoil assessment in these areas, but analyzed historic aerial photos and did not identify other filled wetlands.

J. Stearns summarized that the wildlife on the site was minimal urban wildlife semi fragment from other open spaces (e.g. Spy Pond, Alewife Brook). J. Stearns stated that overall BETA agreed with BSC's wildlife evaluation and confirmed that the building footprint was outside of wetlands resource areas.

S. Chapnick summarized the Commission's most recent comment letter, dated November 20, 2020. The letter made recommendations for five topic areas:

1. Wetlands Delineation
2. Floodplain and Compensatory Flood Storage
3. Stormwater Management
4. Evaluation of Wildlife Habitat and Vegetation
5. Conservation Restriction for Undeveloped of the Mugar Parcel

S. Chapnick stated that the isolated vegetated wetlands delineation did not have a thorough soils assessment and referenced the Town Engineer's comment letter dated December 3, 2020 recommending a more thorough soil assessment.

J. Hession stated that the wetlands delineation was conducted per MassDEP and Army Corps of Engineers standards. A request from the Commission to conduct additional soil assessment would go beyond industry standards and the requirements of a comprehensive permit application.

S. Chapnick stated that she was concerned with the location go the compensatory flood storage, and that the current homeless encampment area may be a better location.

S. Chapnick referenced future flood modeling conducted by the City of Cambridge, as well as Woods Hole Group. These models suggest flooding in this area will become worse due to climate change.

P. Heidell asked whether additional precautions should be taken onsite given the modeling.

T. Undzis stated that the proposed location of the compensatory flood storage area was agreeable due to its upland location. The homelessness encampment area is closer to the Adjacent Upland Resource Area (AURA) and compensatory flood storage there would have a greater resource area impact. T. Undzis stated that the Applicant had sufficiently proven that 2:1 storage was feasible.

S. Chapnick stated that the Commission could recommend that the ZBA condition the permit for this project with a condition requiring the Applicant to re-vegetate or restore the compensatory flood storage area to add habitat value. J. Hession stated that the landscape plan calls out restoration and re-vegetation in the compensatory flood storage area. The planting plan would be developed with the Commission's guidance.

S. Chapnick stated that the rooftop stormwater system did not include enough information for review.

S. Chapnick stated that the existing ground water levels onsite need to be verified.

P. Heidell stated that ground water is usually highest in March and April. Given the specific schedule of 40B Comprehensive Permits, how would the water levels be accurately verified. P. Heidell asked how stormwater infiltration units could be sited without knowing the ground water level.

J. Hession stated that test pit assessments were conducted last week and confirmed that the proposed stormwater unit locations were appropriate. J. Hession stated that the soil drains better than the conditions the stormwater system was designed to.

S. Chapnick stated that the proposed stormwater system meets current State requirements for nutrient removal, but that the State will be updating the standards sometime in 2021. J. Hession stated that the stormwater system meets the current stormwater standards, but the Applicant may consider higher standards if there are no significant financial or logistical implications to the higher standards. S. Chapnick and P.

Heidell stated that the State will likely update the Stormwater Handbook to require that NOAA Atlas 14+ is used for stormwater calculations.

S. Chapnick stated that the ZBA's comprehensive permit regulations include a general statement about climate change, but does not include any climate change standards that could be applied to this project.

S. Kiefer stated that the Applicant may look at NOAA Atlas 14+ to recalculate the stormwater calculations, but ultimately the proposal has to comply with existing standards which do not require NOAA Atlas 14+.

N. Stevens stated that the ZBA has not granted any local waivers at this time, and that Arlington's local regulations require that the Cornell Method be used for stormwater calculations, not TP40 as required by the State Stormwater Handbook. J. Hession stated that the stormwater calculations used the Cornell Method.

S. Chapnick stated that the total number and size of trees impacted by the proposal had not been enumerated yet. S. Chapnick stated that the local regulations specify tree replacement quantities.

S. Chapnick recommended that the Applicant consider conservation stewardship mechanisms for the remaining open space onsite to ensure protection. An example of such a mechanism is a conservation restriction, similar to the Symmes Conservation Restriction.

C. Tirone asked whether the parking area in the western part of the site, close to homes, could be reduced. J. Hession stated that the setback in that area had been increased to provide more buffer between the neighborhood homes and that vegetative screening would be planted. J. Hession stated that area will be graded so no stormwater runoff enters the adjacent parcels. J. Hession stated that parking minimums are required for zoning, which determine the size of the parking areas.

C. Tirone asked for clarification on the lighting of the site. J. Hession stated that the lighting had not been designed yet, but that there are standards the lighting plan will follow given the proximity to neighboring homes.

C. Tirone asked about the site's sewer easement. J. Hession stated that the sewer easement will be protected during construction.

M. Gildesgame asked if the roof rain capture volumes had been calculated. J. Hession stated that those volumes had not been calculated yet and that the roof stormwater system is still under design.

The Working Session was opened for public comment.

Nancy Gray asked how the public could access the Mugar site. The Commission stated that the site is private and that without explicit permission from the property owner the public cannot access the site.

Brian Rehrig asked how the proposal was factoring in future flood risk. B. Rehrig stated that previously the Commission has rejected FEMA floodplain delineations and urged the Commission to review the validity of the floodplain.

Chris Vrotsos asked for examples of similar projects that protected or enhanced the environment and resource areas.

M. Gildesgame motioned to close the Commission meeting, N. Stevens seconded, all were in favor, motioned approved.

Meeting adjourned at 10:40pm.

Town of Arlington, Massachusetts

Review draft 12/17/2020 minutes

Summary:
Review draft 12/17/2020 minutes.

ATTACHMENTS:

	Type	File Name	Description
🗋	Minutes	12172020_Minutes_Conservation_Commission.pdf	Draft 12/17/2020 Minutes

Arlington Conservation Commission

Date: December 17, 2020
Time: 7:30pm
Location: Conducted through Remote Participation using Zoom

Minutes

Attendance: Commission Members Susan Chapnick (Chair), Mike Gildesgame, Pam Heidell, Dave Kaplan, Nathaniel Stevens, Chuck Tirone (Vice Chair), and David White; Associate Commissioners Cathy Garnett and Doug Kilgour; and Conservation Agent Emily Sullivan. Representatives for the Arlington Reservoir NOI hearing included: Joe Connelly (Recreation Department), Leslie Mayer (Park & Recreation Commission), Danielle Desilets (KZLA), Brad Mustain (Woodard & Curran), Denise Cameron (Woodard & Curran), and Mikey Marcus (SWCA). Members of the public included: Jeff Alberti, Ann LeRoyer, David Barlow, Johanna Meyer, Stephan Miller, and Susan Kendall.

Conservation Offset

The Commission reviewed the proposed $7,192 offset for the Conservation Agent's salary. N. Stevens motioned to approve the offset from the Commission's Conservation Commission Fees account, D. White seconded, all were in favor, motion approved. A roll call vote was taken. S Chapnick voted yes, M. Gildesgame voted yes, P. Heidell voted yes, D. Kaplan voted yes, N. Stevens voted yes, C. Tirone voted yes, and D. White voted yes.

Water Bodies Working Group Update

D. White updated the Commission on the Water Bodies Working Group. The Working Group met on December 10, 2020 to review the Reservoir Report submitted by Solitude Lake Management. The Working Group is still waiting for the Spy Pond and Hill's Pond Reports to be submitted. Once all reports are received, the Working Group will meet again to discuss priorities for 2021.

Notice of Intent: 210 Lowell Street, Arlington Reservoir Master Plan Phase 2

MassDEP File #091-0327
Documents Reviewed:

1) *Arlington Reservoir Renovation Project Phase 2 NOI, prepared by SWCA, dated December 3, 2020*
2) *Arlington Reservoir Phase 2 NOI Plan Set, prepared Kyle Zick Landscape Architecture Inc, stamped by Kyle Zick RLA# 1163, dated November 13, 2020*

3) *Arlington Reservoir Phase 2 Stormwater Management Report, prepared by Woodard & Curran, stamped by Denis L Cameron PE# 56348, dated October 2020*

Resource Areas:

1) *100-ft Wetlands Buffer*
2) *Adjacent Upland Resource Area*
3) *Inland Bank*
4) *Arlington Reservoir*

This project consists of the second phase of implementation of the Arlington Reservoir Master Plan and includes the following activities: parking area and stormwater improvements; improvements to existing pathways to make them accessible under the Americans with Disabilities Act (ADA); renovation and addition of new recreational facilities; shoreline bank stabilization; and upland habitat restoration and invasive species removal.

Mickey Marcus and Danielle Desilets presented the project proposal. The project includes elevating the parking lot 16 inches and installing porous pavement as a stormwater best management practice. The stormwater management system meets the water quality standards of the State Stormwater Handbook, but does not meet with water quantity standards because there is no place to store water onsite.

The project proposes to stabilize approximately 2,000 linear feet of bank in Arlington, and slightly more in Lexington using coir fascine and native plantings.

M. Gildesgame asked for more information on the proposed stabilized granite pathway. D. Desilets stated that the stabilized granite material is a material preferred by the Lexington Conservation Commission. It uses a binder and has a gravel sub-base. It is a porous material.

P. Heidell asked if the stabilize granite material had the same drainage characteristics as the porous pavement pilot path. D. Desilets stated that they have similar drainage characteristics.

C. Garnett stated that she was concerned with the stabilized granite material because of her experience with the Neponset River pathway. C. Garnett asked for more information on the material.

Leslie Mayer clarified that the stabilized granite material would mostly be installed in Lexington, and that the Arlington pathway would be touched up using its current surface material. The Arlington pathway was resurfaced when the Reservoir dam was reconstructed. The pathway is in great shape and needs minor touch ups.

S. Chapnick asked that the stormwater calculations be recalculated using NOAA Atlas 14+.

S. Chapnick reminded the Recreation Department and the Park & Recreation Commission that the Order of Conditions for Phase 1 was still open and would eventually need to be closed. Phase 2 permitting could proceed without requesting a Certificate of Compliance for Phase 1.

C. Tirone asked for clarification on the parking lot stormwater system. C. Tirone asked if every grate inlet was attached to a catch basin. B. Mustain clarified that overflow runoff will only occur at or above a 100-year storm, and that the porous pavement parking lot material will manage other storm events if maintained properly. No sheet flow will enter the grates, and water that falls into the grates will be conveyed straight to the Reservoir.

C. Tirone asked if the parking lot above the boat ramp is porous pavement. B. Mustain stated that the parking lot above the boat ramp was not porous, and that the porous pavement only extended from the Reservoir entrance to the sidewalk in the parking lot.

D. Kaplan recommended that a regenerative air sweeper replace the industrial vacuum in the porous pavement parking lot Operations & Maintenance Plan. D. Kaplan how the porosity of the parking lot would be monitored. B. Mustain stated that the parking lot would be visually inspected for porosity.

D. Kaplan asked for clarification on the various invasive treatments proposed as part of the project. M. Marcus clarified that both cut-and-dab and spray application was proposed. M. Marcus stated that Buckthorn is recommended for cut-and-dab treatment, but Japanese knotweed, Phragmites, and Multiflora rose are recommended for spray treatment. D. Kaplan stated that cut-and-dab was preferred over spray treatment. C. Garnett stated that cut-and-dab treatment was an effective method.

The hearing was opened for public comment.

John Verderese asked what was the capacity of the parking lot. The Applicant stated the capacity was essentially the same. John Verderese asked whether DPW would still use the parking lot as a snow storage area. The Applicant stated that snow storage was not recommended and that the Recreation Director would confirm with DPW that the parking lot wouldn't be used for snow storage.

The Commission requested the following supplemental information and materials:
1) Information on Lexington's stabilized granite requirements
2) Recalculate stormwater calculations using NOAA Atlas 14+
3) Review removal/replacement of trees
4) Add erosion controls (silt sack) around turf area in parking lot to prevent siltation
5) Propose alternatives to glyphosate invasive treatment
6) Coordinate with DPW to ensure parking lot is not a snow dump
7) Revise parking lot O&M Plan to include regenerative air sweeper
8) Revise invasive management to include as much cut-and-dab, not spray, as possible
9) Update plan set with changes (erosion controls, plan has erosion control matting near flared end but rip rap might be better)

N. Stevens motioned to continue the public hearing for the Reservoir Phase 2 NOI to the Commission's January 7, 2021 meeting, D. White seconded, all were in favor, motion approved. A roll call vote was taken. S Chapnick voted yes, P. Heidell voted yes, D. Kaplan voted yes, M. Gildesgame voted yes, N. Stevens voted yes, C. Tirone voted yes, and D. White voted yes.

Deliberation: Notice of Intent: 51 Grove Street, Arlington Department of Public Works

MassDEP File #091-0326

Documents Reviewed:

4) *DPW Facility 51Grove Street NOI, prepared by Weston & Sampson, dated October 22, 2020*
5) *Arlington Town Yard Facility 51 Grove Street NOI Plan Set, prepared by Weston & Sampson, dated October 21, 2020*
6) *Supplemental Materials for DPW Facility NOI, prepared by Weston & Sampson, dated 11242020*

Resource Areas:

5) *100-ft Wetlands Buffer*
6) *Adjacent Upland Resource Area*
7) *200-ft Riverfront Area*
8) *Floodplain and Floodway*
9) *Mill Brook*

This project proposes a new/renovated Municipal Facility to support the Department of Public Works (DPW), Inspectional Services Department (ISD), Facilities, and IT departments at 51 Grove Street. The proposed site includes the current 4.4-acre parcel, used by DPW / ISD, and an adjacent 1.4-acre portion of Town-owned land for a total of 5.8 acres. The site has Activity and Use Limitations (AUL) as defined by MassDEP due to site contamination, and therefore has contact barriers and engineered barriers (mostly pavement) per MassDEP requirements to prevent exposure to underlying contaminated soil. Sections of the site are within the 100-ft Wetlands Buffer, AURA, and 200-ft Riverfront Area of Mill Brook, as well as floodway and floodplain.

The Conservation Commission had a working session for this project proposal during its August 20, 2020 meeting. The public hearing for this NOI began at the Commission's November 5, 2020 meeting and was continued to the December 3, 2020 meeting. The public hearing was closed on December 3, 2020.

The Commission reviewed a draft Order of Conditions for the project. The Commission discussed edits to the draft. P. Heidell motioned to approve the project under the Wetlands Protection Act and Arlington Regulations for Wetlands Project with the discussed conditions, D. White seconded, all were in favor, motion approved. A roll call vote was taken. S Chapnick voted yes, M. Gildesgame voted yes, P. Heidell voted yes, D. Kaplan voted yes, C. Tirone voted yes, and D. White voted yes. N. Stevens missed a prior hearing on this project and was not eligible to vote.

Thorndike Place Update
D. White recused himself from the discussion.

S. Chapnick updated the Commission on the status of the Thorndike Place Comprehensive 40B Permit. During the December 3, 2020 working session, the Commission stated that it did not accept the wetlands delineation conducted by BSC Group. The Commission had requested additional soil assessment during the working session. S. Chapnick stated that the Town's Special Town Counsel recommended that the Commission assume the two isolated vegetated wetlands are jurisdictional.

S. Chapnick clarified that Comprehensive Permits cannot be assessed at higher standards than other projects.

The Commission reviewed a draft comment letter addressed to the ZBA.

N. Stevens motioned to close the Commission meeting, M. Gildesgame seconded, all were in favor, motioned approved.

Meeting adjourned at 10:15pm.

Town of Arlington, Massachusetts

Review draft 2020 annual report

Summary:
Review draft 2020 annual report.

ATTACHMENTS:

	Type	File Name	Description
	Reference Material	ACC_2020_Annual_Report_draft.pdf	Draft 2020 Annual Report

Conservation Commission

The Arlington Conservation Commission ("ACC") is required by state and town laws to protect and preserve wetlands, waterways, and their surrounding areas. The ACC is comprised of seven volunteer Commissioners and two volunteer Associate Commissioners, who are appointed by the Town Manager with the approval of the Select Board, and supported by the full-time professional Environmental Planner & Conservation Agent at bimonthly meetings and onsite visits. The ACC is mandated to protect wetlands, waterways, water supplies, fisheries, wildlife, and wildlife habitat as well as regulate floodplain activities through its administration of the Massachusetts Wetlands Protection Act and the Arlington Bylaw for Wetlands Protection.

In 2020, the ACC held 24 public meetings, and provided coordination, monitoring, permit review, and consultation on numerous residential, commercial, and municipal projects around Town. The ACC reviewed 21 applications. Of the 21 applications, the Commission issued 10 Permits/Orders of Conditions, 5 Determinations of Applicability, and six Certificates of Compliance. The ACC and its Agent conducted over 60 site visits/inspections.

The ACC also protects and manages the Town's Conservation Lands and natural resources through collaboration with other entities and grants from various sources, as described below.

Spy Pond Shoreline Protection Project Completion

The goals of this project included preserve, stabilize, and strengthen the pond's banks to control erosion; protect and enhance wildlife habitat; prevent unauthorized paths; broaden and strengthen constituency groups; improve water quality and recreational opportunities; and improve stormwater infiltration. Construction elements of this project included a new porous pathway through the park, a new timber overlook, a rain garden/vegetated detention basin, and native plantings along the pond banks. The project was completed in Fall 2020. Various funding sources funded this project, including a Community Preservation Act grant ($552,900), a Land and Water Conservation Fund grant from the Massachusetts Executive Office of Energy and Environmental Affairs ($40,040), a Community Development Block grant ($94,000), a Mass Audubon's Judy Record Fund grant ($10,000), and a donation from the Friends of Spy Pond Park ($5,000).

The Spy Pond Project included constructing a biobasin next to Scannell Field to improve stormwater quality before entering Spy Pond. (credit: Arlington Conservation Commission)

Wellington Park & Mill Brook

In 2018, Arlington received one of the first Executive Office of Energy and Environmental Affairs Municipal Vulnerability Preparedness MVP action grants, in the amount of almost $400,000 to increase flood storage capacity in Wellington Park, along Mill Brook. This increased flood storage capacity is approximately 70 cubic yards. Project construction included building the flood storage channel, removing invasive plant species, building a boardwalk, installing a porous asphalt pathway, and installing educational signage. In 2020, Arlington and the Mystic River Watershed Association (MyRWA) led the design effort for the last phase of this project, to improve the recreational amenities of the park. The final design includes extending the porous asphalt pathway through the park to the existing bridge over Mill Brook, the construction of an exploration play area, the installation of a biobasin, and replanting of native riverine plants along Mill Brook. The final phase of this project will begin construction in 2021.

Water Bodies Oversight

The ACC, through its Water Bodies Working Group, continued monitoring important water bodies in town, including Spy Pond, the Arlington Reservoir, and Hill's Pond in Monotony Rocks Park.

Conservation Land Stewards

The ACC's citizen-volunteer organization, Arlington Land Stewards (ALS), assists in managing 28 Town-owned conservation lands comprising approximately 53 acres. Land Stewards monitor, coordinate, and maintain conservation land of their choice, with guidance from the ACC.

Arlington Great Meadows

Arlington's Great Meadows (AGM) are comprised of 193 acres, making it Arlington's largest open space parcel, although located in East Lexington. AGM is mostly wetlands, but contain many upland trails that make connections to the Arlington Reservoir and the Whipple Hill conservation area through the ACROSS Trail System. The Friends of Arlington's Great Meadows (FoAGM) are active in increasing Arlington's awareness of this wonderful area. In 2020, FoAGM organized multiple walks at AGM and boardwalk restoration events.

FoAGM volunteers maintain the trails and boardwalks at the Meadows. This includes removing invasive plants, consisting primarily of Japanese Knotweed, along the Minuteman Bikeway. More information on FoAGM can be found at: www.FoAGM.org.

A current concern is the redevelopment of the former nursing site off Emerson Garden Road that will affect a popular access point. Officials in Arlington and Lexington are committed to maintaining public access at this location.

Goals and Beyond

The ACC will continue to encourage, support, and assist the various volunteer and environmental advocacy groups that are dedicated to preserving the Town's valued conservation lands and other open spaces. These groups include, among others: Arlington Land Stewards, Arlington Land Trust, Open Space Committee, Friends of Arlington's Great Meadows, Friends of Spy Pond Park, Friends of Menotomy Rock Park, and the Mystic River Watershed Association. Additional specific goals include the following:

- Host additional collaborative community clean-up and educational events
- Strengthen and update regulations for performance standards, permitting efficiency, and process clarity
- Improve the stewardship of conservation lands and other town open spaces
- Improve communication and educational outreach to residents in resource areas

Acknowledgments

ACC sincerely thanks all individuals and organizations that contributed directly or indirectly to the activities of its 55th year. Many special thanks go to the active citizenry that attended hearings and informed the Commission's discussions and the scores of volunteers who came out for clean-up projects, assisted as land stewards, or participated in the many Friends groups that work to preserve the Town's natural resources and conservation lands.

Warrant Article Submission Form

PETITION OF TEN REGISTERED VOTERS FOR INSERTION OF ARTICLE INTO THE WARRANT FOR THE ANNUAL (SPECIAL) TOWN MEETING.

File Completed Form with the Office of the Select Board no later than Friday, January 29, 2021, 12:00/Noon.

We, the undersigned registered voters (10 for Annual, 100 for Special) of the Town of Arlington, hereby petition the Select Board pursuant to MGL c. 39, § 10 to insert the following article(s) into the warrant for the Annual (Special) Town Meeting.

ARTICLE
Proposed Title:

ZONING BYLAW AMENDMENT/ALLOW CEMETERY USE IN THE OPEN SPACE DISTRICT

Subject Matter:

OPEN SPACE AND CEMETARY USE

> To see if the Town will vote to amend the Zoning Bylaw in Articles 5, 6, and 11 and elsewhere as may by required, to allow cemetery use solely for cremated remains on land under the jurisdiction of the Conservation Commission by special permit subject to Environmental Design Review, or take any action related thereto.

Requested by:

Allan Tosti

! Watermill Place, Unit 419, Arlington, MA 02476

781 820-1580

abtosti@outlook.com

Town of Arlington, Massachusetts

Notice of Intent

Summary:

Notice of Intent: Arlington Reservoir Master Plan Phase 2, 210 Lowell Street
Continued Hearing
MassDEP File #091-0327

7:45pm	This project consists of the second phase of implementation of the Arlington Reservoir Master Plan and includes the following activities: parking area and stormwater improvements; improvements to existing pathways to make them accessible under the Americans with Disabilities Act (ADA); renovation and addition of new recreational facilities; shoreline bank stabilization; and upland habitat restoration and invasive species removal. Proposed project work is within the 100-ft Wetlands Buffer and Inland Bank area of the Arlington Reservoir. This project was first presented to the Commission at its 12/17/2020 meeting.

ATTACHMENTS:

Type	File Name	Description
Notice of Intent	Arlington_Reservoir_Phase_2_NOI_12032020.pdf	Res Phase 2 NOI
Notice of Intent	Arlington_Reservoir_Phase_2_NOI_Plans_12032020.pdf	Res Phase 2 NOI Plans
Notice of Intent	Arlington_Reservoir_Phase_2_Stormwater_Report_12032020.pdf	Res Phase 2 Stormwater Report
Notice of Intent	Arlington_Reservoir_Phase_2_Supplemental_KZLA_Memo_12302020.pdf	NEW_Res Phase 2 Supplemental KZLA Memo
Notice of Intent	Arlington_Reservoir_Phase_2_Supplemental_SWCA_Memo_12312020.pdf	NEW_Res Phase 2 Supplemental SWCA Memo
Notice of Intent	Arlington_Reservoir_Phase_2_Tree_Planting_Plans_Revised.pdf	NEW_Res Phase 2 Revised Tree Planting Plan
Notice of Intent	Arlington_Reservoir_Phase_2_Parking_Lot_Plans_Revised.pdf	NEW_Res Phase 2 Revised Parking Lot Plan
Notice of Intent	Arlington_Reservoir_Phase_2_Stormwater_Report_Revised.pdf	NEW_ Res Phase 2 Revised Stormwater Report

Notice of Intent:

Arlington Reservoir Renovation Project – Phase 2

Arlington/Lexington, Massachusetts

December 2020

PREPARED FOR

Arlington Parks & Recreation Commission
Arlington, Massachusetts

PREPARED BY

SWCA Environmental Consultants
Kyle Zick Landscape Architecture, Inc.

SWCA Project No.: 60780

SWCA®
ENVIRONMENTAL CONSULTANTS
Sound Science. Creative Solutions.®

Amherst Office
15 Research Drive
Amherst, Massachusetts 01002
Tel 413.256.0202 Fax 413.256.1092

December 3, 2020

Arlington Conservation Commission
730 Mass Ave. Annex
Arlington, MA 02476

Re: Arlington Reservoir Project
Notice of Intent
Arlington & Lexington, MA

Dear Members of the Conservation Commission:

On behalf of the Town of Arlington ("Applicant"), SWCA Environmental Consultants ("SWCA") and Kyle Zick Landscape Architecture (KZLA) have prepared this Notice of Intent ("NOI") application for work within regulated resource areas and buffer zone associated with the Bathing Beach Improvements to the Arlington Reservoir in Arlington and Lexington, Massachusetts. This NOI is being submitted pursuant to the Massachusetts Wetlands Protection Act ("WPA") (M.G.L. Ch. 31 s. 40) and its implementing regulations at 310 CMR 10.00, the Arlington Wetlands Protection Bylaw ("Arlington Bylaw") and the Lexington Wetlands Protection Bylaw ("Lexington Bylaw"). The Project consists of improvements to the reservoir's existing walking path, bank stabilization, and upland habitat restoration to manage invasive species.

The Project will require work on Inland Bank, and the 100-foot buffer zone to Inland Bank, as regulated under the WPA and the Bylaws. Work being proposed in the buffer zone is within a previously developed, recreational area and is intended to improve recreational access to the public. Some work along the pond bank will require minimal encroachment into the pond for the purposes of bank stabilization and establishment of native plants; however, the encroachment will consist of biodegradable stacked coir logs and native plants to establish an aquatic shelf to help stabilize the bank. The area along the bank above the created aquatic shelf will be regraded and restored with native plantings (please refer to the attached Design Development Set prepared by SWCA for details). The project team has met with members of both the Arlington and Lexington Conservation Commissions on-site and discussed the proposed work and have concurred that the proposal is the least impacting alternative to achieve the goals of: improved public access, bank stabilization, and upland restoration. Although many of the proposed activities meet the Limited Project provisions at 310 CMR 10.53(3) and (4), the Project has been designed to meet the performance standards for all wetland resource areas to the maximum extent practicable.

Notification has been made on this date to abutters. A copy of the abutter notification form is provided in Appendix A. As a municipal project, the work is exempt from State and Local filing fees.

SWCA respectfully requests that the Arlington Conservation Commission finds the Project adequately protective of the interests of the WPA and Bylaw and issue an Order of Conditions allowing the Project to proceed as described in this NOI. We look forward to presenting this Project to the Conservation Commission.

An NOI is being submitted separately to the Lexington Conservation Commission in mid-December. Since work at the Res spans the Towns of Arlington and Lexington, we request that the Conservation Commissions coordinate language in the Orders of Conditions so that the site contractors may work with one set of Conditions. If you have any questions regarding this application or would like to set up a site walk, please do not hesitate to contact me at 413-531-7156.

Sincerely,

Mickey Marcus, PWS

cc. MassDEP, Northeast Regional Office
Town of Arlington Parks and Recreation Commission
Kyle Zick Landscape Architecture
Woodard & Curran Engineering

WPA FORM 3

Arlington

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 3 – Notice of Intent

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Provided by MassDEP:

MassDEP File Number

Document Transaction Number

Arlington
City/Town

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

Note: Before completing this form consult your local Conservation Commission regarding any municipal bylaw or ordinance.

A. General Information

1. Project Location (**Note:** electronic filers will click on button to locate project site):

210 Lowell Street	Arlington	02476
a. Street Address	b. City/Town	c. Zip Code

Latitude and Longitude: 42.42833°N (d. Latitude) 71.18659°W (e. Longitude)

Map 61 Block 1	Lot 4
f. Assessors Map/Plat Number	g. Parcel /Lot Number

2. Applicant:

Joseph	Connelly
a. First Name	b. Last Name

Town of Arlington Parks & Recreation Commission
c. Organization

422 Summer Street
d. Street Address

Arlington	Massachusetts	02476
e. City/Town	f. State	g. Zip Code

781-316-3880		jconnelly@town.arlington.ma.us
h. Phone Number	i. Fax Number	j. Email Address

3. Property owner (required if different from applicant): ☐ Check if more than one owner

a. First Name | b. Last Name

c. Organization

d. Street Address

e. City/Town | f. State | g. Zip Code

h. Phone Number | i. Fax Number | j. Email address

4. Representative (if any):

Mickey	Marcus
a. First Name	b. Last Name

SWCA Environmental Inc
c. Company

15 Research Drive
d. Street Address

Amherst	MA	01002
e. City/Town	f. State	g. Zip Code

413-531-7156		mmarcus@swca.com
h. Phone Number	i. Fax Number	j. Email address

5. Total WPA Fee Paid (from NOI Wetland Fee Transmittal Form):

N/A	N/A	N/A
a. Total Fee Paid	b. State Fee Paid	c. City/Town Fee Paid

Massachusetts Department of Environmental Protection
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A. General Information (continued)

6. General Project Description:

The Arlington Parks and Recreation Commission proposes the Arlington Reservoir Renovation Project Phase II, which includes parking area improvements, installation of new ADA-accessible pathways, new recreational facilities, a boat launch, bathing beach improvements, bank stabilization measures, and invasive species control/upland habitat restoration.

7a. Project Type Checklist: (Limited Project Types see Section A. 7b.)

1. ☐ Single Family Home
2. ☐ Residential Subdivision
3. ☐ Commercial/Industrial
4. ☐ Dock/Pier
5. ☐ Utilities
6. ☐ Coastal engineering Structure
7. ☐ Agriculture (e.g., cranberries, forestry)
8. ☐ Transportation
9. ☒ Other

7b. Is any portion of the proposed activity eligible to be treated as a limited project (including Ecological Restoration Limited Project) subject to 310 CMR 10.24 (coastal) or 310 CMR 10.53 (inland)?

1. ☒ Yes ☐ No   If yes, describe which limited project applies to this project. (See 310 CMR 10.24 and 10.53 for a complete list and description of limited project types)

Beach improvements [10.53(3)(h)], water dependent uses [10.53(3)(l)], ecological restoration project [10.53(4)]

If the proposed activity is eligible to be treated as an Ecological Restoration Limited Project (310 CMR10.24(8), 310 CMR 10.53(4)), complete and attach Appendix A: Ecological Restoration Limited Project Checklist and Signed Certification.

8. Property recorded at the Registry of Deeds for:

Middlesex County	N/A
a. County	b. Certificate # (if registered land)
01	01
c. Book	d. Page Number

B. Buffer Zone & Resource Area Impacts (temporary & permanent)

1. ☐ Buffer Zone Only – Check if the project is located only in the Buffer Zone of a Bordering Vegetated Wetland, Inland Bank, or Coastal Resource Area.
2. ☒ Inland Resource Areas (see 310 CMR 10.54-10.58; if not applicable, go to Section B.3, Coastal Resource Areas).

Check all that apply below. Attach narrative and any supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

For all projects affecting other Resource Areas, please attach a narrative explaining how the resource area was delineated.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☒ Bank	2,000 (approximately) 1. linear feet	2,000 (approximately) 2. linear feet
b. ☐ Bordering Vegetated Wetland	0 1. square feet	0 2. square feet
c. ☐ Land Under Waterbodies and Waterways	1. square feet 0 3. cubic yards dredged	2. square feet

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
d. ☐ Bordering Land Subject to Flooding	1. square feet 3. cubic feet of flood storage lost	2. square feet 4. cubic feet replaced
e. ☐ Isolated Land Subject to Flooding	1. square feet 2. cubic feet of flood storage lost	3. cubic feet replaced

f. ☒ Riverfront Area — Mill Brook (inland)
1. Name of Waterway (if available) - **specify coastal or inland**

2. Width of Riverfront Area (check one):

☐ 25 ft. - Designated Densely Developed Areas only

☐ 100 ft. - New agricultural projects only

☒ 200 ft. - All other projects

3. Total area of Riverfront Area on the site of the proposed project: 30,000 square feet

4. Proposed alteration of the Riverfront Area:

a. total square feet	b. square feet within 100 ft.	c. square feet between 100 ft. and 200 ft.
		0

5. Has an alternatives analysis been done and is it attached to this NOI? ☐ Yes ☒ No

6. Was the lot where the activity is proposed created prior to August 1, 1996? ☒ Yes ☐ No

3. ☐ Coastal Resource Areas: (See 310 CMR 10.25-10.35)

Note: for coastal riverfront areas, please complete **Section B.2.f.** above.

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B. Buffer Zone & Resource Area Impacts (temporary & permanent) (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

Check all that apply below. Attach narrative and supporting documentation describing how the project will meet all performance standards for each of the resource areas altered, including standards requiring consideration of alternative project design or location.

Resource Area	Size of Proposed Alteration	Proposed Replacement (if any)
a. ☐ Designated Port Areas	Indicate size under Land Under the Ocean, below	
b. ☐ Land Under the Ocean	1. square feet 2. cubic yards dredged	
c. ☐ Barrier Beach	Indicate size under Coastal Beaches and/or Coastal Dunes below	
d. ☐ Coastal Beaches	1. square feet	2. cubic yards beach nourishment
e. ☐ Coastal Dunes	1. square feet	2. cubic yards dune nourishment
	Size of Proposed Alteration	**Proposed Replacement (if any)**
f. ☐ Coastal Banks	1. linear feet	
g. ☐ Rocky Intertidal Shores	1. square feet	
h. ☐ Salt Marshes	1. square feet	2. sq ft restoration, rehab., creation
i. ☐ Land Under Salt Ponds	1. square feet 2. cubic yards dredged	
j. ☐ Land Containing Shellfish	1. square feet	
k. ☐ Fish Runs	Indicate size under Coastal Banks, inland Bank, Land Under the Ocean, and/or inland Land Under Waterbodies and Waterways, above 1. cubic yards dredged	
l. ☐ Land Subject to Coastal Storm Flowage	1. square feet	

4. ☐ Restoration/Enhancement
If the project is for the purpose of restoring or enhancing a wetland resource area in addition to the square footage that has been entered in Section B.2.b or B.3.h above, please enter the additional amount here.

a. square feet of BVW

b. square feet of Salt Marsh

5. ☐ Project Involves Stream Crossings

a. number of new stream crossings

b. number of replacement stream crossings

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C. Other Applicable Standards and Requirements

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section C and complete Appendix A: Ecological Restoration Limited Project Checklists – Required Actions (310 CMR 10.11).

Streamlined Massachusetts Endangered Species Act/Wetlands Protection Act Review

1. Is any portion of the proposed project located in **Estimated Habitat of Rare Wildlife** as indicated on the most recent Estimated Habitat Map of State-Listed Rare Wetland Wildlife published by the Natural Heritage and Endangered Species Program (NHESP)? To view habitat maps, see the *Massachusetts Natural Heritage Atlas* or go to http://maps.massgis.state.ma.us/PRI_EST_HAB/viewer.htm.

a. ☐ Yes ☒ No

If yes, include proof of mailing or hand delivery of NOI to:

Natural Heritage and Endangered Species Program
Division of Fisheries and Wildlife
1 Rabbit Hill Road
Westborough, MA 01581

2017
b. Date of map

If *yes*, the project is also subject to Massachusetts Endangered Species Act (MESA) review (321 CMR 10.18). To qualify for a streamlined, 30-day, MESA/Wetlands Protection Act review, please complete Section C.1.c, and include requested materials with this Notice of Intent (NOI); *OR* complete Section C.2.f, if applicable. *If MESA supplemental information is not included with the NOI, by completing Section 1 of this form, the NHESP will require a separate MESA filing which may take up to 90 days to review (unless noted exceptions in Section 2 apply, see below).*

c. Submit Supplemental Information for Endangered Species Review*

1. ☐ Percentage/acreage of property to be altered:

(a) within wetland Resource Area ____________ percentage/acreage

(b) outside Resource Area ____________ percentage/acreage

2. ☐ Assessor's Map or right-of-way plan of site

2. ☐ Project plans for entire project site, including wetland resource areas and areas outside of wetlands jurisdiction, showing existing and proposed conditions, existing and proposed tree/vegetation clearing line, and clearly demarcated limits of work **

(a) ☐ Project description (including description of impacts outside of wetland resource area & buffer zone)

(b) ☐ Photographs representative of the site

* Some projects **not** in Estimated Habitat may be located in Priority Habitat, and require NHESP review (see http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/regulatory-review/). Priority Habitat includes habitat for state-listed plants and strictly upland species not protected by the Wetlands Protection Act.

** MESA projects may not be segmented (321 CMR 10.16). The applicant must disclose full development plans even if such plans are not required as part of the Notice of Intent process.

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C. Other Applicable Standards and Requirements (cont'd)

(c) ☐ MESA filing fee (fee information available at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_fee_schedule.htm). Make check payable to "Commonwealth of Massachusetts - NHESP" and ***mail to NHESP*** at above address

*Projects altering **10 or more acres** of land, also submit:*

(d) ☐ Vegetation cover type map of site

(e) ☐ Project plans showing Priority & Estimated Habitat boundaries

(f) OR Check One of the Following

1. ☐ Project is exempt from MESA review. Attach applicant letter indicating which MESA exemption applies. (See 321 CMR 10.14, http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/mesa/mesa_exemptions.htm; the NOI must still be sent to NHESP if the project is within estimated habitat pursuant to 310 CMR 10.37 and 10.59.)

2. ☐ Separate MESA review ongoing. a. NHESP Tracking # b. Date submitted to NHESP

3. ☐ Separate MESA review completed. Include copy of NHESP "no Take" determination or valid Conservation & Management Permit with approved plan.

3. For coastal projects only, is any portion of the proposed project located below the mean high water line or in a fish run?

   a. ☒ Not applicable – project is in inland resource area only b. ☐ Yes ☐ No

   If yes, include proof of mailing, hand delivery, or electronic delivery of NOI to either:

   South Shore - Cohasset to Rhode Island border, and the Cape & Islands:

   Division of Marine Fisheries -
   Southeast Marine Fisheries Station
   Attn: Environmental Reviewer
   836 South Rodney French Blvd.
   New Bedford, MA 02744
   Email: DMF.EnvReview-South@state.ma.us

   North Shore - Hull to New Hampshire border:

   Division of Marine Fisheries -
   North Shore Office
   Attn: Environmental Reviewer
   30 Emerson Avenue
   Gloucester, MA 01930
   Email: DMF.EnvReview-North@state.ma.us

   Also if yes, the project may require a Chapter 91 license. For coastal towns in the Northeast Region, please contact MassDEP's Boston Office. For coastal towns in the Southeast Region, please contact MassDEP's Southeast Regional Office.

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C. Other Applicable Standards and Requirements (cont'd)

Online Users: Include your document transaction number (provided on your receipt page) with all supplementary information you submit to the Department.

4. Is any portion of the proposed project within an Area of Critical Environmental Concern (ACEC)?

   a. ☐ Yes ☒ No — If yes, provide name of ACEC (see instructions to WPA Form 3 or MassDEP Website for ACEC locations). **Note:** electronic filers click on Website.

   b. ACEC

5. Is any portion of the proposed project within an area designated as an Outstanding Resource Water (ORW) as designated in the Massachusetts Surface Water Quality Standards, 314 CMR 4.00?

   a. ☐ Yes ☒ No

6. Is any portion of the site subject to a Wetlands Restriction Order under the Inland Wetlands Restriction Act (M.G.L. c. 131, § 40A) or the Coastal Wetlands Restriction Act (M.G.L. c. 130, § 105)?

   a. ☐ Yes ☒ No

7. Is this project subject to provisions of the MassDEP Stormwater Management Standards?

   a. ☒ Yes. Attach a copy of the Stormwater Report as required by the Stormwater Management Standards per 310 CMR 10.05(6)(k)-(q) and check if:

      1. ☐ Applying for Low Impact Development (LID) site design credits (as described in Stormwater Management Handbook Vol. 2, Chapter 3)

      2. ☒ A portion of the site constitutes redevelopment

      3. ☐ Proprietary BMPs are included in the Stormwater Management System.

   b. ☐ No. Check why the project is exempt:

      1. ☐ Single-family house

      2. ☐ Emergency road repair

      3. ☐ Small Residential Subdivision (less than or equal to 4 single-family houses or less than or equal to 4 units in multi-family housing project) with no discharge to Critical Areas.

D. Additional Information

☐ This is a proposal for an Ecological Restoration Limited Project. Skip Section D and complete Appendix A: Ecological Restoration Notice of Intent – Minimum Required Documents (310 CMR 10.12).

Applicants must include the following with this Notice of Intent (NOI). See instructions for details.

Online Users: Attach the document transaction number (provided on your receipt page) for any of the following information you submit to the Department.

1. ☒ USGS or other map of the area (along with a narrative description, if necessary) containing sufficient information for the Conservation Commission and the Department to locate the site. (Electronic filers may omit this item.)

2. ☒ Plans identifying the location of proposed activities (including activities proposed to serve as a Bordering Vegetated Wetland [BVW] replication area or other mitigating measure) relative to the boundaries of each affected resource area.

Massachusetts Department of Environmental Protection
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Provided by MassDEP:

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D. Additional Information (cont'd)

3. ☒ Identify the method for BVW and other resource area boundary delineations (MassDEP BVW Field Data Form(s), Determination of Applicability, Order of Resource Area Delineation, etc.), and attach documentation of the methodology.

4. ☒ List the titles and dates for all plans and other materials submitted with this NOI.

Arlington Reservoir Phase 2
a. Plan Title

Kyle Zick Landscape Architecture, Inc
b. Prepared By

Kyle Zick, RLA
c. Signed and Stamped by

September 25, 2020
d. Final Revision Date

varies
e. Scale

Bank Restoration Plans, SWCA
f. Additional Plan or Document Title

September 29, 2020
g. Date

5. ☐ If there is more than one property owner, please attach a list of these property owners not listed on this form.

6. ☐ Attach proof of mailing for Natural Heritage and Endangered Species Program, if needed.

7. ☐ Attach proof of mailing for Massachusetts Division of Marine Fisheries, if needed.

8. ☐ Attach NOI Wetland Fee Transmittal Form

9. ☒ Attach Stormwater Report, if needed.

E. Fees

1. ☒ Fee Exempt: No filing fee shall be assessed for projects of any city, town, county, or district of the Commonwealth, federally recognized Indian tribe housing authority, municipal housing authority, or the Massachusetts Bay Transportation Authority.

Applicants must submit the following information (in addition to pages 1 and 2 of the NOI Wetland Fee Transmittal Form) to confirm fee payment:

2. Municipal Check Number

3. Check date

4. State Check Number

5. Check date

6. Payor name on check: First Name

7. Payor name on check: Last Name

Massachusetts Department of Environmental Protection
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Provided by MassDEP:

MassDEP File Number

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F. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Notice of Intent and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge. I understand that the Conservation Commission will place notification of this Notice in a local newspaper at the expense of the applicant in accordance with the wetlands regulations, 310 CMR 10.05(5)(a).

I further certify under penalties of perjury that all abutters were notified of this application, pursuant to the requirements of M.G.L. c. 131, § 40. Notice must be made by Certificate of Mailing or in writing by hand delivery or certified mail (return receipt requested) to all abutters within 100 feet of the property line of the project location.

Joseph J Conr... 11/12/2020
1. Signature of Applicant 2. Date

3. Signature of Property Owner (if different) 4. Date

Mickey Marcus
Digitally signed by Mickey Marcus
DN: cn=Mickey Marcus, o=SWCA Environmental Consultants, ou, email=mmarcus@swca.com, c=US
Date: 2020.11.12 14:02:10 -05'00'
5. Signature of Representative (if any) 6. Date

For Conservation Commission:
Two copies of the completed Notice of Intent (Form 3), including supporting plans and documents, two copies of the NOI Wetland Fee Transmittal Form, and the city/town fee payment, to the Conservation Commission by certified mail or hand delivery.

For MassDEP:
One copy of the completed Notice of Intent (Form 3), including supporting plans and documents, one copy of the NOI Wetland Fee Transmittal Form, and a **copy** of the state fee payment to the MassDEP Regional Office (see Instructions) by certified mail or hand delivery.

Other:
If the applicant has checked the "yes" box in any part of Section C, Item 3, above, refer to that section and the Instructions for additional submittal requirements.

The original and copies must be sent simultaneously. Failure by the applicant to send copies in a timely manner may result in dismissal of the Notice of Intent.

NOTICE OF INTENT N
ARLINGTON RESERVOIR RENOVATION PROJECT–PHASE 2
ARLINGTON AND LEXINGTON, MASSACHUSETTS

Prepared for

Arlington Parks & Recreation Commission
422 Summer Street
Arlington, MA 02474
Attn: Joseph Connelly, Director

SWCA Environmental Consultants
15 Research Drive
Amherst, MA 01002
413-531-7156
www.swca.com

Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street
Boston, MA 02108
617-451-1018
www.kylezick.com

SWCA Project No. 60780

December 2020

CONTENTS

Appendices

1 INTRODUCTION

SWCA Environmental Consultants (SWCA) in conjunction with Kyle Zick Landscape Architecture (KZLA) and Woodard & Curran Engineering (W&C) have prepared this Notice of Intent (NOI) on behalf of the Town of Arlington Parks & Recreation Commission for the proposed Arlington Reservoir Renovation Project – Phase 2 (Project). The Project consists of the second phase of implementation of the Arlington Reservoir Master Plan and includes the following activities:

- parking area and stormwater improvements
- improvements to existing pathways to make them accessible under the Americans with Disabilities Act (ADA)
- renovation and adding new recreational facilities, including renovations of the existing bathhouse and concessions building, lifeguard stands, picnic tables, a playground, a multi-use court, boat launch, check-in shelter, and several other site improvements.
- bank stabilization measures along the reservoir shore; and
- upland habitat restoration / invasive species removal.

This project work is a continuation of the Phase I Master Plan for the Res completed in 2018 by the Town of Arlington and Weston & Sampson engineers.

This joint NOI is submitted to the Arlington and Lexington Conservation Commissions pursuant to the Massachusetts Wetland Protection Act (WPA) MGL c.131 §40 and its Regulations, 310 CMR 10.00, the Arlington Wetlands Protection Bylaw (Arlington Bylaw) and the Lexington Wetlands Protection Bylaw (Lexington Bylaw) for activities within jurisdictional wetland resource areas and buffer zones. A copy of the NOI has also been provided to the Massachusetts Department of Environmental Protection (MassDEP).

We are providing both the Towns of Arlington and Lexington with a full set of the site plans. Separate NOI forms have been prepared for each of the Towns.

2 SITE DESCRIPTION

The Arlington Reservoir (Res) is in the Arlington Heights neighborhood with Lowell Street on the eastern side of the property. Although all the Res and its shoreline are owned by the Town of Arlington, approximately half of the area is located within the Town of Lexington. The total area of the Res is approximately 65 acres. The 28 acre reservoir was created in 1871 for use as a water supply by damming Munroe Brook. The Res is no longer used as a water supply source. The Res currently offers the community with recreational opportunities for swimming, fishing, walking, non-motorized boating, and other outdoor pursuits. During the summer months, the Town of Arlington operates a chlorinated and filtered swim area, separated from the main body of the pond by an Embankment. Facilities at the bathing beach are proposed to be updated, and several of these facilities are within the 100 foot buffer zone.

There is a gravel parking area off Lowell Street which is the primary site access. A dam with two outlets for flood mitigation is maintained and is in good condition having been rebuilt in 2006. A nearly one mile long walking path encircles the Res. There has been an active program to control invasive aquatic vegetation within the open water, and this NOI does not overlap with these activities, except to provide a reinforced boat ramp to permit weed harvesters better access to the water.

The pond banks are heavily eroded due to a combination of natural wind/water erosion, but also due to fishing and pond edge access for recreation.

Munroe Brook enters the Res on the northwest in the Town of Lexington, and the outlet is to the south in Arlington via a dam at the confluence with Sickle Brook to form Mill Brook.

2.1 Wetland Resources

The Arlington and Lexington Conservation Commission have previously reviewed project work and wetlands at the Res. The Arlington Conservation Commission issued Orders of Conditions for file 091-0304 for work at the bathing beach and a test plot of the walking path, and the Lexington Conservation Commission issued Orders for this same project work under DEP File: 201-1117 on January 7, 2019. This NOI is a continuation of the previous project work, but since there is additional work in wetland Resource Areas (primarily for bank restoration and beach renovation) a new NOI is appropriate rather than to amend the previous Orders of Conditions. We will request that the open Orders for both Towns should be closed.

Given the heavy use of the Res by residents, we did not place flagging tape to show the top of the bank. These areas were surveyed and are shown on the site plan. There is no BVW proposed to be altered as part of this project. We describe invasive species control within the uplands, and a significant amount of this work will be within the 100 foot buffer of the Res. The Town of Arlington has determined not to remove any trees, even those which may be non-native; the invasive species control/removal will be herbaceous vegetation and shrubs.

2.1.1 *Land Under Waterbodies and Waterways*

The entire Res (approximately 28 acres) is LUW. The Town of Arlington has retained Solitude Lake Services to help manage the invasive aquatic vegetation (preliminary water chestnut), and this NOI does not propose work within LUW. The bank stabilization and restoration work proposed is within the Bank wetland resource area.

No work is proposed within any of the perennial or intermittent streams on the Res. Work for the walking path reconstruction and bank stabilization will be within the 200 foot Riverfront Area of Munroe Brook, but there is no new clearing or permanent alteration of habitat.

2.1.2 *Inland Bank*

Embankment. A stone berm separates the bathing beach from the main body of the Res and is located both in Arlington and Lexington (see site plans L1.1 and L1.2).The total area is approximately 12,520 square feet and is jurisdictional bank (10.54). This area is currently overgrown and vegetated with trees and shrubs and provides both an informal walking path as well as wildlife habitat. Although it is "bank", it is not deemed to provide important wildlife habitat (10.54 (4)(a)(5) due to the stone construction. It is proposed to clear this area of invasive vegetation (multiflora rose, autumn olive, bittersweet, purple loosestrife). Poison ivy on the embankment is also proposed to be removed. Work on the embankment is to provide better public access, including ADA compliant use. The trees are not proposed to be cut.

Pond Bank. Most of the banks of the Res are steep and eroded. This NOI proposes to repair all the eroded banks over time (see bank restoration figure). We have surveyed the edge of the Res and have shown a color-coded map of the erosion observed during the summer of 2020. The areas shown in red (Treatment A) shows heavily eroded areas with more than 12 inch high banks, with a vertical profile. The areas shown in Orange (Treatment B) are moderately eroded vertically banks less than 12 inches high.

The Yellow areas (Treatment C) are stable banks with little or no erosion, and no recommendations for stabilization, except for restoring vegetation along the bank and adjacent slopes. The Green areas (Treatment D) are stable banks with good vegetation cover, and no action or treatments are proposed, except for the removal of invasive species. We are recommending that four separate Treatment A areas should be the first phase of bank restoration. These are locations are shown on sheet 2 of the restoration site plans and include: 305 feet adjacent to the parking lot and boat launch; 270 feet along the outlet structure (used for fishing); 145 feet along an area of an eroded piped inlet; and 125 linear feet adjacent to the Munroe Brook inlet. These four eroded and unstable areas are the highest priority for the first phase of bank stabilization.

The proposed bank stabilization exceeds the 50 foot wildlife habitat threshold; however, the bank restoration may be permitted by the Conservation Commissions as the proposed work will not have an adverse effect on wildlife habitat in accordance with the procedures contained in 10.60. We are proposing all biodegradable materials and native plantings to reduce erosion, and enhance wildlife habitat features along the shoreline of the Res.

The proposed work extends from the lower boundary of Bank to the upper boundary of Bank. The lower boundary fluctuates based on the reservoir level but is typically 156.8 feet.

2.1.3 *Bordering Land Subject to Flooding*

The water level within the Res is controlled by the dam and two outlet control structures. No alteration of BLSF is proposed.

2.1.4 *Buffer Zone/Erosion Control*

Almost the entire Res property is within the 100 buffer zone to the banks of the Res, or inlet/outlet streams. There is significant new work proposed within the buffer zone, and sediment and erosion controls are proposed adjacent to all new work activities, include the bank restoration work.

Compost filled filter socks are proposed to be used in the upland areas adjacent to all site work to protect the Res from sedimentation. For the bank restoration we are proposing the use of a turbidity curtain to be placed between the edge of the work at the open water to protect the Res from site work and erosion during construction. Silt sacks will be installed in existing catch basins draining to the Res, and tree protection fencing will be used to separate and protect existing trees during construction activities. Site Plan LD1.1 shows the details of the proposed erosion controls.

2.2 Other Sensitive Resources

SWCA reviewed the Massachusetts Geographic Information System (MassGIS) to determine if the proposed project is within or near other sensitive environmental areas. These areas included protected rare species, important watersheds, and other special environmental characteristics. There are no known sensitive resources within the work area.

2.2.1 *Natural Heritage and Endangered Species Review Program (NHESP)*

SWCA reviewed the MassGIS database to determine if the project is located within or adjacent to areas designated as NHESP Priority Habitats of Rare Species, Estimated Habitats of Rare Wildlife, certified vernal pools (CVP), or potential vernal pools (PVP). No Priority Habitats, Estimated Habitats, CVPs or

PVPs are mapped by MassGIS in the area. No potentially certifiable vernal pools were noted during field investigations.

2.2.2 *Outstanding Resource Waters and Areas of Critical Environmental Concern*

SWCA reviewed the MassGIS database to determine if the site is located within Outstanding Resource Waters (ORWs) or Areas of Critical Environmental Concern (ACECs). ORWs are watershed areas that have been classified as such under the Massachusetts Surface Water Quality Standards and are areas that contain surface waters and their tributaries, including certain wetlands, that have been designated for protection based on their outstanding socio-economic, recreational, ecological and/or aesthetic values. These waters have been identified so that the quality of the waters may be protected and maintained. ACECs are areas designated in Massachusetts that receive special recognition because of the quality, uniqueness, and significance of its natural and/or and cultural resources. There are no ORWs or ACECs located within or adjacent to the proposed project area.

3 PROPOSED WORK

The goal of this project work by the Tow of Arlington is to improve the recreational opportunities of the entire Res property, and to improve the ecological health of the pond. The Town of Arlington has recognized that the stormwater management of the Res should be improved, and the sediment and nutrient loading into the Res could be improved by improvements to the existing parking areas, and shoreline. The following is a summary of the proposed work as outlined in the site plans.

3.1 Project Description

The Project consists of the second phase of implementation of the Arlington Reservoir Master Plan and includes the following activities:

- parking area improvements
- Stormwater upgrades
- improvements to existing pathways to make them accessible under the Americans with Disabilities Act (ADA)
- renovated or new recreational facilities, including renovations of the existing bathhouse and concessions building, lifeguard stands, picnic tables, a playground, a multi-use court, boat launch, check-in shelter, and several other surficial site improvements
- bank stabilization measures along the reservoir shore; and
- upland habitat restoration / invasive species removal.

Depending on permitting, and bidding, the construction activities are expected to begin in March 2021 and to be completed in November 2021. The Town anticipates that the bank restoration work will be completed as funding allows, starting with the most eroded locations as shown on the restoration site plans. Each of these activities are further described below.

3.1.1 *Parking Area Improvements*

The existing gravel parking area will be replaced with permeable concrete pavers, porous pavement, and concrete pavement. Accessible parking will be incorporated into the parking lot, and a concrete boat launch area will be established for non-motorized boats, and to ensure entry to the open water for the weed harvester used for aquatic species removal and control. Benches, a canoe storage rack, and revegetation plan are proposed within the redeveloped parking lot. Site plan L2.2 shows the details of the parking area.

The Arlington Parks & Recreation Commission proposes to install porous pavement over the approximately 0.5-acre gravel parking area in the southern portion of the site.

3.1.2 *Stormwater Management*

A stormwater management report in compliance with DEP stormwater regulations was prepared by Woodard & Curran and dated October 2020. The proposed design uses Low Impact Development designs as recommended in the Phase I Master Plan (2018) and with current DEP stormwater management recommendations. The project work will use porous pavement materials to replace a 0.5 acre gravel parking lot. The proposed stormwater measures also include the renovation of the existing bathhouse ad concessions building, the installation of new ADA accessible concrete pathways, the playground, boat launch, an athletic court, and several other surficial site improvements. The proposed work is a redevelopment project as there are no new development areas, only improvements of existing developed areas, and the improvement of stormwater management and water quality to the Res.

In accordance with the MA stormwater regulations, storm events from 1 year (2.67 inches) to the 100 year storm event (8.85 inches) were evaluated. The parking lot restoration includes a 21,500 square foot area of porous pavement, and the multi-purpose athletic court is also designed with permeable materials to maximize infiltration. In addition to the multi-layers of stone and gravel, the design has built in sufficient storage capacity to retain the 100 year storm event. Beyond this storm event, the drainage will discharge via three outlets to the Res.

The goal of the stormwater management is to improve the existing site conditions by infiltrating stormwater rather than having a direct overland flow into the Res. We anticipate immediate improvements to water quality in the Res by reducing the nutrient load and reducing the total suspended solids currently in the stormwater runoff.

The stormwater calculations (see page 9 of the stormwater report) shows a net decrease in the post development rate of runoff from the 1 year to the 100 year storm event, and full compliance with the DEP stormwater management standards. A copy of the DEP stormwater checklist is included at the end of the stormwater management report.

3.1.3 *Walking Path Improvements*

The existing walking path is composed of gravel and un-improved packed dirt and un-even surfaces. It is proposed to replace the existing trail with an 8 foot wide to 12 foot wide crushed granite path, with an alternate design using a rubber surfaced trail. The rebuilt trail will be installed around the circumference of the Res to replace the existing trail with a uniform and ADA compliant surface. The surface will be underlain by a crushed stone base. Plan Sheet LD1.2 provides the details of the walking path.

Additional paths which join other walkways will be re-built and made ADA compliant. All walking paths are within the 100 foot buffer zone to the Bank, and sediment and erosion controls are proposed (compost sock) adjacent to all work areas until the construction is completed and the site stabilized.

3.1.4 *Other Recreational Structures*

The proposed work will rebuild the bathing beach & recreational facilities to include a new playground, ADA compliant access, refreshing bathing beach sand, concession buildings, athletic court, pump house, and bathhouse. The existing buildings will be fully renovated. Sheets L1.1 shows the northern end of these facilities, and L1.2 shows the southern end of the facilities. There are additional structures proposed around the Res and these include benches, trash and recycling receptacles, a large hexagonal bench, a picnic pavilion, boulders, signage, and other similar features.

Almost all work is within the 100 foot buffer zone to the banks of the Res, and sediment and erosion controls (compost sock) is proposed to be installed between all work areas and the open water, including on either side of the embankment. These locations are shown on the site plan LD1.2 and LD1.3.

A new boat launch is proposed for recreational non-motorized boats. It is proposed using an articulating concrete block ramp (see Plan detail on Sheet LD1.3) which will allow the launching of the weed harvester used to collect water chestnut, and for aquatic plant management pond access. A canoe rack is proposed to be installed near the boat launch.

3.1.5 *Bank Stabilization*

As described in an earlier section, the banks of the Res have significant areas of erosion due to normal processes from wind and water, but also due to heavy use by recreational uses who want access to the open water. Design plans to use biodegradable coir (coconut fiber) are to be used against the vertically eroded banks, with the soil backfilled behind the logs. Details are provided on the restoration site plans Sheet 4.0. For the eroded bank sections with less than 12 inches of vertical erosion one 12 inch coir log installed against the bank face is proposed. Where the vertical erosion is greater than 12 inches high, a stacked arrangement of three coir logs will be used. The coir will be held in place with duck bill earth anchors and wire. This anchoring method will not use protruding stakes which may be a hazard to young children clamoring over the bank. Coir is not permanent and has a normal life span of approximately 5 years. The coir does provide a stable bank which allows the installed native vegetation to become established and allows the roots to help permanently stabilize the shoreline.

The following table shows the total bank restoration proposed in the NOI. The Town of Arlington will conduct this work in phases, and funding permits.

Table 1. Bank Restoration

Area	**Type of Erosion**	**Total linear feet**	**Estimated Restoration Planting (square feet)**
Area A	High erosion >12”	2,120	31,800
Area B	Moderate erosion <12”	1,650	24,750
Area C	Stable. Planting only	130	1,950
Area D	Stable. Planting only	680	10,200
Embankment	Stable		Invasive removal only

Native trees, shrubs and emergent plant species are proposed to be used in conjunction with the bank stabilization work. The total buffer zone habitat revegetation enhancement is 68,700 square feet. Restoration Plan Sheet 5.0 includes a list of the proposed revegetation planting plan to be implemented. We anticipate that the restoration of the bank and adjacent habitat will be restored over time, as funding permits. The restoration plantings will follow the bank stabilization and the invasive species removal as described below. A native seed mix has been specified to restore disturbed soils in the buffer zone and shady areas adjacent to the Res.

3.1.6 *Upland Habitat Restoration/Invasive Species Removal*

Revegetation. Landscape plantings have been incorporated into the design plans by KZLA and these areas are shown on the site plan drawings. Sheet L4.4 incorporates the restoration using trees and shrubs to be used to revegetate the different shoreline restoration areas. Sheet L4.2A provides the plant list to be incorporated in the bathing beach and parking lot areas which includes trees, shrubs, and groundcover plantings. The revitalization of the landscape is an important aspect of this project, and the goal is to establish new shade trees, and to provide a native and attractive landscape planting to replace the older landscaping and plants in poor condition.

Invasive Species Management. The invasive plant species identified at the project site by SWCA and KZLA included the following species: multiflora rose (*Rosa multiflora*); common buckthorn (*Rhamnus cathartica*); autumn olive (*Elaeagus umbellate*); Oriental bittersweet (*Celatrus orbiculatus*); Japanese Barberry; burning bush; Black Swallowort; Japanees Knotweed and purple loosestrife (*Lythrum salicaria*). Poison ivy (*Toxicodendron radicans)*, although not a listed invasive species, was observed throughout the project site and will be managed due to its potential to cause harm to recreational users. Invasive trees such as Black Locust and Norway Maple are not proposed to be cut or managed. Invasive species management will be conducted to reduce or eradicate the invasive plant species identified within the project limits. Due to the varying levels of plant maturity and presence of both herbaceous and woody invasive species, various methods of management will be utilized to provide the most effective control.

Herbaceous species such as purple loosestrife and immature woody invasive species seedlings will be managed with a foliar herbicide application. Foliar treatments will be conducted by using a low-pressure backpack sprayer or handheld sprayer to apply an herbicide solution to the leaves of the target species. All

foliar management will be conducted as spot treatments where individual target plants are selected for treatment. Broadcast treatments are not proposed. Foliar applications require the use of a non-ionic surfactant to provide successful control. SWCA proposes the use of a non-ionic surfactant approved for use within wetland areas for this project. For all foliar applications, a 2% solution of Rodeo (glyphosate) or 2.56 ounces of herbicide per gallon of water will be applied with 1% or 1.33 ounces of the surfactant. Following successful control of herbaceous populations and other target plants, dead invasive species material will be removed and disposed of offsite.

Target invasive trees, shrubs, and vines encountered within the project limits will be managed with cut-stem herbicide treatments. Cut-stem treatments will involve the use of hand tools (chainsaws, pruners, loppers, etc.) to cut the stem or vine followed by a spray or wipe application of herbicide solution to the exposed stem surface. All cuts will be made within 6-inches of the ground and the cut material will be removed and disposed of offsite. Invasive vines such as Oriental bittersweet encountered climbing on trees will be cut and removed to the greatest extent feasible. Special care will be taken to avoid damages to the native canopy during removal. Following cutting, a 50% solution of Rodeo or 64 ounces of herbicide per gallon of water will be applied to the freshly cut surface. The herbicide solution will be applied using a handheld sprayer or a brush/swab.

All invasive species management will be conducted during the summer months while the target plants are actively growing. Treatments should be conducted between July and August of each year and should be separated by at-least two weeks. Approximately two herbicide treatments should be scheduled per season for at-least two years following initiation of project work. As regulated by the label for the products, the applicator will not apply more than 8 quarts of Rodeo per acre, per year at the project site. A marking dye will be used to help the applicators identify the treated plant materials as they are working and to minimize overspray onto non-target species during the herbicide applications.

We anticipate that the control of invasive species at the Res will be a long-term endeavor and will require multiple years to bring the invasive species population under control. We will therefore request that the Arlington and Lexington Conservation Commission along the control of upland invasive species to be part of the O&M plan and to be a non-expiring Condition. We anticipate that year end reports by the Certified Applicator will be provided to the Conservation Commissions.

3.2 Project Impacts

There are short term impacts to Inland Bank during restoration, but no long-term alteration or filling. The proposed work is ecological restoration of a degraded wetland Resource Area. We anticipate the bank restoration work will be a long-term project to be completed over multiple years and will require continuing Conditions to allow the long-term maintenance of the restored bank and vegetation.

The total area of high and moderate bank erosion is 3,770 linear feet.

3.3 Mitigation Measures

In addition to the restoration of the Bank. We estimate the restoration of the upland buffer zone to be approximately 68,700 square feet. The restoration work is anticipated to be a long-term project at the Res and will be conducted over multiple years. We will request the Conservation Commissions to issue a non-expiring Order to permit the maintenance of the buffer zone vegetation that will include revegetation and the removal of invasive species.

4 REGULATORY REVIEW

The proximity of jurisdictional resources to the project work area at the Res falls under the regulation of the WPA and its implementing regulations, the Town of Arlington Wetlands Protection Bylaw, and the Town of Lexington Wetlands Protection Bylaw. We request coordination by both Towns to issue Orders of Conditions which contain the same language as the site contractors will be working in both Arlington and Lexington to implement the beach improvement project and restoration work.

5 SUMMARY

The proposed work plan is the implementation phase and follows the initial recommendations of Phase I of the Master Plan for the Res. There are significant site improvements proposed for the recreational use of the bathing beach and play areas. The gravel parking area is proposed to be rebuilt using permeable materials to infiltrate stormwater, and to improve the water quality of the Res. Reconstruction of the walking path around the Res, and numerous infrastructure features are proposed. The eroded bank segments along the shoreline are proposed to be restored and stabilized, and invasive species are proposed to be removed, and replaced with native species.

There are no wetland resource areas which will be lost. The work within resource areas is for restoration purposes and will result in improved stormwater management, improved wildlife habitat, and a decrease in nutrients and sediment entering the Res. This NOI does not include aquatic vegetation control within the Res. Work proposed is along the Bank and Buffer Zone.

We anticipate the major infrastructure project work at the Res will be completed within the next three years, but the ecological restoration work will likely be initiated over a longer time due to funding availability. For this reason, we request the Conservation Commissions to consider issuing a 5 year Order of Conditions to allow for continued bank and buffer zone restoration work. We are also requesting the Conservation Commissions to issue non-expiring Conditions for the maintenance of the restored infrastructure, stormwater management, bank restoration, and invasive species control.

APPENDIX A

Abutter Notification

Office of the Board of Assessors
Robbins Memorial Town Hall
Arlington, MA 02476
(781) 316-3050
Assessors@town.arlington.ma.us

Abutters List

Date: November 12, 2020

Subject Property Address: 0-LOT LOWELL ST Arlington, MA
Subject Property ID: 61-1-4

Search Distance: 100 Feet - Conservation

The Board of Assessors certifies the names and addresses of requested parties in interest, all abutters to a single parcel within 100 feet.

Please see enclosed map for any abutting property within 100 feet that is in another city or town.

Kevin C. Feeley
Robert E. Greeley

Board of Assessors

Printed on 11/10/2020 at 08:57 AM

Abutters List
Date: November 12, 2020
Subject Property Address: 0-LOT LOWELL ST Arlington, MA
Subject Property ID: 61-1-4
Search Distance: 100 Feet

Prop ID: 61-1-3
Prop Location: 0-LOT MASS AVE Arlington, MA
Owner: TOWN OF ARLINGTON PARK
Co-Owner:
Mailing Address:
730 MASS AVE
ARLINGTON, MA 02476

Prop ID: 61-1-4
Prop Location: 0-LOT MASS AVE Arlington, MA
Owner: TOWN OF ARLINGTON PARK
Co-Owner:
Mailing Address:
730 MASS AVE
ARLINGTON, MA 02476

Prop ID: 61-1-5
Prop Location: 202 LOWELL ST Arlington, MA
Owner: YOUNG DOUGLAS W & CATHRINE K
Co-Owner:
Mailing Address:
202 LOWELL STREET
ARLINGTON, MA 02474

Prop ID: 61-1-6
Prop Location: 198 LOWELL ST Arlington, MA
Owner: SCHWARTZ ELIZABETH
Co-Owner:
Mailing Address:
198 LOWELL ST
ARLINGTON, MA 02474

Prop ID: 61-1-7
Prop Location: 194 LOWELL ST Arlington, MA
Owner: BULL PETER
Co-Owner: DOIDGE THEA
Mailing Address:
194 LOWELL STREET
ARLINGTON, MA 02474

Prop ID: 61.A-10-1
Prop Location: 10 COLONIAL VILLAGE DR UNIT JI
Arlington, MA
Owner: VALLE ALISON Y
Co-Owner:
Mailing Address:
10 COLONIAL VILLAGE DR #1
ARLINGTON, MA 02474

Prop ID: 61.A-10-10
Prop Location: 10 COLONIAL VILLAGE DR UNIT J10
Arlington, MA
Owner: SULLIVAN ROSEMARY T
Co-Owner:
Mailing Address:
10 COLONIAL VILLAGE DR #10
ARLINGTON, MA 02474

Prop ID: 61.A-10-11
Prop Location: 10 COLONIAL VILLAGE DR UNIT J11
Arlington, MA
Owner: GILLIGAN BARBARA YEM- HANG/ TRS
Co-Owner: BARBARA YEM-HANG GILLIGAN
Mailing Address:
10 COLONIAL VILLAGE DR #11
ARLINGTON, MA 02474

Prop ID: 61.A-10-12
Prop Location: 10 COLONIAL VILLAGE DR UNIT J12
Arlington, MA
Owner: BRASIL DEASSIS MORAES GUSTAVO
Co-Owner: SOARES CRISTIANE
Mailing Address:
10 COLONIAL VILLAGE DR #12
ARLINGTON, MA 02474

Prop ID: 61.A-10-2
Prop Location: 10 COLONIAL VILLAGE DR UNIT J2
Arlington, MA
Owner: IORDANIDIS ATHINA
Co-Owner:
Mailing Address:
10 COLONIAL VILLAGE DR #2
ARLINGTON, MA 02474

Prop ID: 61.A-10-3
Prop Location: 10 COLONIAL VILLAGE DR UNIT J3
Arlington, MA
Owner: ROGERS BRUCE LEE
Co-Owner: LI JINYU
Mailing Address:
107 PINE ST
WOBURN, MA 01801-3373

Prop ID: 61.A-10-4
Prop Location: 10 COLONIAL VILLAGE DR UNIT J4
Arlington, MA
Owner: VAN RHEENEN CONNIE
Co-Owner:
Mailing Address:
38 BRADBURY STREET
CAMBRIDGE, MA 02138

Prop ID: 61.A-10-5
Prop Location: 10 COLONIAL VILLAGE DR UNIT J5
Arlington, MA
Owner: ABUGOV GREGORY & VICTORIA
Co-Owner:
Mailing Address:
16 ENDICOTT PL
CANTON, MA 02021

Prop ID: 61.A-10-6
Prop Location: 10 COLONIAL VILLAGE DR UNIT J6
Arlington, MA
Owner: PINE DANIEL R
Co-Owner:
Mailing Address:
51 STOWCROFT RD
ARLINGTON, MA 02474

Prop ID: 61.A-10-7
Prop Location: 10 COLONIAL VILLAGE DR UNIT J7
Arlington, MA
Owner: HAN XIAOGANG &
Co-Owner: DONG JENNIFER
Mailing Address:
508 LOWELL ST
LEXINGTON, MA 02420

Prop ID: 61.A-10-8
Prop Location: 10 COLONIAL VILLAGE DR UNIT J8
Arlington, MA
Owner: LIN ZHOUFANG
Co-Owner:
Mailing Address:
10 COLONIAL VILLAGE DR #8
ARLINGTON, MA 02474

Prop ID: 61.A-10-9
Prop Location: 10 COLONIAL VILLAGE DR UNIT J9
Arlington, MA
Owner: CHAN MARY KAR-MI
Co-Owner:
Mailing Address:
10 COLONIAL VILLAGE DR #9
ARLINGTON, MA 02474

Prop ID: 61.A-1-1
Prop Location: 1 COLONIAL VILLAGE DR UNIT A1
Arlington, MA
Owner: BAGWADIA ZUBIN ETAL TR
Co-Owner: HOPE CYRUS BAGWADIA
Mailing Address:
87 OAK RIDGE TER
LYNNFIELD, MA 01940

Prop ID: 61.A-1-10
Prop Location: 1 COLONIAL VILLAGE DR UNIT A10
Arlington, MA
Owner: ZHOU XIAOXIONG
Co-Owner: A/K/A ZHOU FLORA
Mailing Address:
1 COLONIAL VILLAGE DR #10
ARLINGTON, MA 02474

Prop ID: 61.A-1-11
Prop Location: 1 COLONIAL VILLAGE DR UNIT A11
Arlington, MA
Owner: BARRY ELLEN J
Co-Owner:
Mailing Address:
1 COLONIAL VILLAGE DR #11
ARLINGTON, MA 02474

Prop ID: 61.A-11-1
Prop Location: 11 COLONIAL VILLAGE DR UNIT K1
Arlington, MA
Owner: LOPEZ DAVID
Co-Owner: QUIROS LOURDES
Mailing Address:
146 OAKLAND ST
MALDEN, MA 02148

Prop ID: 61.A-11-10
Prop Location: 11 COLONIAL VILLAGE DR UNIT K10
Arlington, MA
Owner: LOPEZ DAVID F
Co-Owner:
Mailing Address:
146 OAKLAND ST
MALDEN, MA 02148

Prop ID: 61.A-11-11
Prop Location: 11 COLONIAL VILLAGE DR UNIT K11
Arlington, MA
Owner: HIGGINS JAMES F
Co-Owner:
Mailing Address:
4836 COMANCHE TRAIL
PRESCOTT, AZ 86301

Prop ID: 61.A-11-12
Prop Location: 11 COLONIAL VILLAGE DR UNIT K12
Arlington, MA
Owner: WALKER KATHRYN R
Co-Owner:
Mailing Address:
11 COLONIAL VILLAGE DR #12
ARLINGTON, MA 02474

Prop ID: 61.A-1-12
Prop Location: 1 COLONIAL VILLAGE DR UNIT A12
Arlington, MA
Owner: MA ZHOUYANG
Co-Owner:
Mailing Address:
1 COLONIAL VILLAGE DR #12
ARLINGTON, MA 02474

Prop ID: 61.A-11-2
Prop Location: 11 COLONIAL VILLAGE DR UNIT K2
Arlington, MA
Owner: TIERNEY LAURA J TRUSTEE
Co-Owner: PIANTES SOUTH MIDDLESEX COUNTY
Mailing Address:
216 RANGEWAY RD UNIT 142
NORTH BILLERICA, MA 01862

Prop ID: 61.A-11-3
Prop Location: 11 COLONIAL VILLAGE DR UNIT K3
Arlington, MA
Owner: DIMILLA JULIE ELIZABETH
Co-Owner:
Mailing Address:
11 COLONIAL VILLAGE DR #3
ARLINGTON, MA 02474

Prop ID: 61.A-11-4
Prop Location: 11 COLONIAL VILLAGE DR UNIT K4
Arlington, MA
Owner: TU WENHONG
Co-Owner:
Mailing Address:
26 SADDLE CLUB RD
LEXINGTON, MA 02420

Prop ID: 61.A-11-5
Prop Location: 11 COLONIAL VILLAGE DR UNIT K5
Arlington, MA
Owner: LOPEZ DAVID F
Co-Owner:
Mailing Address:
146 OAKLAND ST
MALDEN, MA 02148

Prop ID: 61.A-11-6
Prop Location: 11 COLONIAL VILLAGE DR UNIT K6
Arlington, MA
Owner: VAN MOORTEL MARJORIE
Co-Owner:
Mailing Address:
11 COLONIAL VILLAGE DR #6
ARLINGTON, MA 02474

Prop ID: 61.A-11-7
Prop Location: 11 COLONIAL VILLAGE DR UNIT K7
Arlington, MA
Owner: TU WENJIE
Co-Owner:
Mailing Address:
11 COLONIAL VILLAGE DR #7
ARLINGTON, MA 02474

Prop ID: 61.A-11-8
Prop Location: 11 COLONIAL VILLAGE DR UNIT K8
Arlington, MA
Owner: BURKE CHARLES TR
Co-Owner: C/O HILARIE CHANDLER MGMT
Mailing Address:
19 DOONAN STREET
TR OF S.R. REALTY TRUST
MEDFORD, MA 02155

Prop ID: 61.A-11-9
Prop Location: 11 COLONIAL VILLAGE DR UNIT K9
Arlington, MA
Owner: VEZNAIAN MARY
Co-Owner:
Mailing Address:
11 COLONIAL VILLAGE DR #9
ARLINGTON, MA 02474

Prop ID: 61.A-1-2
Prop Location: 1 COLONIAL VILLAGE DR UNIT A2
Arlington, MA
Owner: HERZBERG LORRIE
Co-Owner:
Mailing Address:
1 COLONIAL VILLAGE DR #2
ARLINGTON, MA 02474

Prop ID: 61.A-12-1
Prop Location: 12 COLONIAL VILLAGE DR UNIT L1
Arlington, MA
Owner: SONAM TENZIN
Co-Owner:
Mailing Address:
4 BRIDLE PATH
SUDBURY, MA 01776

Prop ID: 61.A-12-10
Prop Location: 12 COLONIAL VILLAGE DR UNIT L10
Arlington, MA
Owner: SHARP JOHN D & KENNETH G/ TRS
Co-Owner: 2019 CLIFFORD A SHARP
Mailing Address:
12 COLONIAL VILLAGE DR
UNIT 10
ARLINGTON, MA 02474

Prop ID: 61.A-12-11
Prop Location: 12 COLONIAL VILLAGE DR UNIT L11
Arlington, MA
Owner: MURPHY EDWARD
Co-Owner:
Mailing Address:
12 COLONIAL VILLAGE DR UNIT 11
ARLINGTON, MA 02474

Prop ID: 61.A-12-12
Prop Location: 12 COLONIAL VILLAGE DR UNIT L12
Arlington, MA
Owner: BAI DONGFANG
Co-Owner: FEI XINGYUAN
Mailing Address:
12 COLONIAL VILLAGE DR
APT 12
ARLINGTON, MA 02474

Prop ID: 61.A-12-2
Prop Location: 12 COLONIAL VILLAGE DR UNIT L2
Arlington, MA
Owner: LAZURE PETER B/ LIFE ESTATE
Co-Owner:
Mailing Address:
12 COLONIAL VILLAGE DR
UNIT 2
ARLINGTON, MA 02474

Prop ID: 61.A-12-3
Prop Location: 12 COLONIAL VILLAGE DR UNIT L3
Arlington, MA
Owner: DAY STEVEN J
Co-Owner:
Mailing Address:
12 COLONIAL VILLAGE DR #3
ARLINGTON, MA 02474

Prop ID: 61.A-12-4
Prop Location: 12 COLONIAL VILLAGE DR UNIT L4
Arlington, MA
Owner: JONES MARILYN J & RICHARD C/ TRS
Co-Owner: JONES 2020 FAMILY TRUST
Mailing Address:
225 PHEASANT AVE
ARLINGTON, MA 02474

Prop ID: 61.A-12-5
Prop Location: 12 COLONIAL VILLAGE DR UNIT L5
Arlington, MA
Owner: MORILLO-TAYLOR LILIANA
Co-Owner:
Mailing Address:
2675 MONTROSE PL
SANTA BARBARA, CA 93105

Prop ID: 61.A-12-6
Prop Location: 12 COLONIAL VILLAGE DR UNIT L6
Arlington, MA
Owner: KUNWAR CHHABINDRA
Co-Owner: KUNWAR SUSHMA
Mailing Address:
12 COLONIAL VILLAGE DR #6
ARLINGTON, MA 02474

Prop ID: 61.A-12-7
Prop Location: 12 COLONIAL VILLAGE DR UNIT L7
Arlington, MA
Owner: MISAWA TAKAKO
Co-Owner:
Mailing Address:
12 COLONIAL VILLAGE DR #7
ARLINGTON, MA 02474

Prop ID: 61.A-12-8
Prop Location: 12 COLONIAL VILLAGE DR UNIT L8
Arlington, MA
Owner: PIRNIA SHAHRZAD
Co-Owner:
Mailing Address:
21409 DAVIS MILL RD
GERMANTOWN, MD 20876

Prop ID: 61.A-12-9
Prop Location: 12 COLONIAL VILLAGE DR UNIT L9
Arlington, MA
Owner: FERREIRA JOYCE P
Co-Owner:
Mailing Address:
12 COLONIAL VILLAGE DR #9
ARLINGTON, MA 02474

Prop ID: 61.A-1-3
Prop Location: 1 COLONIAL VILLAGE DR UNIT A3
Arlington, MA
Owner: FARINO CARLOS
Co-Owner: FARINO-VIDAL ZORAYDA
Mailing Address:
4 SYLVIA ST
LEXINGTON, MA 02421

Prop ID: 61.A-1-4
Prop Location: 1 COLONIAL VILLAGE DR UNIT A4
Arlington, MA
Owner: HE JIANG
Co-Owner: YAO TIANQING
Mailing Address:
1 COLONIAL VILLAGE DR
#4
ARLINGTON, MA 02474

Prop ID: 61.A-1-5
Prop Location: 1 COLONIAL VILLAGE DR UNIT A5
Arlington, MA
Owner: WU DAI
Co-Owner:
Mailing Address:
1 COLONIAL VILLAGE DR #5
ARLINGTON, MA 02474

Prop ID: 61.A-1-6
Prop Location: 1 COLONIAL VILLAGE DR UNIT A6
Arlington, MA
Owner: CARSER DIANE L
Co-Owner:
Mailing Address:
1 COLONIAL VILLAGE DR #6
ARLINGTON, MA 02474

Prop ID: 61.A-1-7
Prop Location: 1 COLONIAL VILLAGE DR UNIT A7
Arlington, MA
Owner: ISMAYLOV DMITRIY
Co-Owner:
Mailing Address:
48 SHADY HILL RD
WESTON, MA 02493

Prop ID: 61.A-1-8
Prop Location: 1 COLONIAL VILLAGE DR UNIT A8
Arlington, MA
Owner: WANG PINGLANG & YING
Co-Owner:
Mailing Address:
35 SKYLINE DR
STATEN ISLAND, NY 10304

Prop ID: 61.A-1-9
Prop Location: 1 COLONIAL VILLAGE DR UNIT A9
Arlington, MA
Owner: SABIO DARIO R & JOSEFINA B/TRS
Co-Owner: SABIO FMLY REVOCABLE LIVING TR
Mailing Address:
10598 SANTERNO ST
LAS VEGAS, NV 89141

Prop ID: 61.A-2-1
Prop Location: 2 COLONIAL VILLAGE DR UNIT B1
Arlington, MA
Owner: DONG JENNIFER Q
Co-Owner: HAN XIAOGANG
Mailing Address:
508 LOWELL ST
LEXINGTON, MA 02420

Prop ID: 61.A-2-10
Prop Location: 2 COLONIAL VILLAGE DR UNIT B10
Arlington, MA
Owner: TAM THOMAS &
Co-Owner: TAM WINNIE YIN
Mailing Address:
25 WINCHESTER DRIVE
LEXINGTON, MA 02420

Prop ID: 61.A-2-11
Prop Location: 2 COLONIAL VILLAGE DR UNIT B11
Arlington, MA
Owner: RAMSAY RAYLENE L
Co-Owner:
Mailing Address:
2 COLONIAL VILLAGE DR #11
ARLINGTON, MA 02474

Prop ID: 61.A-2-12
Prop Location: 2 COLONIAL VILLAGE DR UNIT B12
Arlington, MA
Owner: TANO YUKI NOBU
Co-Owner:
Mailing Address:
2 COLONIAL VILLAGE DR #12
ARLINGTON, MA 02474

Prop ID: 61.A-2-2
Prop Location: 2 COLONIAL VILLAGE DR UNIT B2
Arlington, MA
Owner: SQUIRES PROPERTIES LLC
Co-Owner:
Mailing Address:
344 BISHOPS FOREST DR
WALTHAM, MA 02452

Prop ID: 61.A-2-3
Prop Location: 2 COLONIAL VILLAGE DR UNIT B3
Arlington, MA
Owner: BERGMAN BRUCE L
Co-Owner:
Mailing Address:
2 COLONIAL VILLAGE DR #3
ARLINGTON, MA 02474

Prop ID: 61.A-2-4
Prop Location: 2 COLONIAL VILLAGE DR UNIT B4
Arlington, MA
Owner: LEDDY WILLIAM A
Co-Owner:
Mailing Address:
2 COLONIAL VILLAGE DR #4
ARLINGTON, MA 02474

Prop ID: 61.A-2-5
Prop Location: 2 COLONIAL VILLAGE DR UNIT B5
Arlington, MA
Owner: ZHANG YUANYE
Co-Owner: HAO XINMING
Mailing Address:
60 ALBEMARLE AVE
LEXINGTON, MA 02420

Prop ID: 61.A-2-6
Prop Location: 2 COLONIAL VILLAGE DR UNIT B6
Arlington, MA
Owner: MORONEY KEVIN F & PAUL R/TRS
Co-Owner: MORONEY FAMILY REALTY TRUST
Mailing Address:
2 COLONIAL VILLAGE DR #6
ARLINGTON, MA 02474

Prop ID: 61.A-2-7
Prop Location: 2 COLONIAL VILLAGE DR UNIT B7
Arlington, MA
Owner: QUAN SUSAN
Co-Owner:
Mailing Address:
67 SLADE ST
BELMONT, MA 02478

Prop ID: 61.A-2-8
Prop Location: 2 COLONIAL VILLAGE DR UNIT B8
Arlington, MA
Owner: WANG ROBERT T & KATHY K/TRS
Co-Owner: WANG REALTY TRUST
Mailing Address:
402 HEATHER DR
LYNNFIELD, MA 01940

Prop ID: 61.A-2-9
Prop Location: 2 COLONIAL VILLAGE DR UNIT B9
Arlington, MA
Owner: WANG LIANGYUN
Co-Owner:
Mailing Address:
75 SAINT ALPHONSUS ST
BOSTON, MA 02120

Prop ID: 61.A-3-1
Prop Location: 3 COLONIAL VILLAGE DR UNIT C1
Arlington, MA
Owner: COSTA MARIA C
Co-Owner:
Mailing Address:
39 BENTON RD
SOMERVILLE, MA 02143

Prop ID: 61.A-3-10
Prop Location: 3 COLONIAL VILLAGE DR UNIT C10
Arlington, MA
Owner: CRONIN WILLIAM E JR
Co-Owner:
Mailing Address:
327 LOWELL ST
LEXINGTON, MA 02420

Prop ID: 61.A-3-11
Prop Location: 3 COLONIAL VILLAGE DR UNIT C11
Arlington, MA
Owner: KINIRY JOHN J JR
Co-Owner:
Mailing Address:
3 COLONIAL VILLAGE DR #11
ARLINGTON, MA 02474

Prop ID: 61.A-3-12
Prop Location: 3 COLONIAL VILLAGE DR UNIT C12
Arlington, MA
Owner: DITROIA ELIZABETH
Co-Owner:
Mailing Address:
3 COLONIAL VILLAGE DR # 12
ARLINGTON, MA 02474

Prop ID: 61.A-3-2
Prop Location: 3 COLONIAL VILLAGE DR UNIT C2
Arlington, MA
Owner: BENNETT FREDERICK
Co-Owner: BENNETT YUAN WEI MARY
Mailing Address:
3 COLONIAL VILLAGE DR #2
ARLINGTON, MA 02474

Prop ID: 61.A-3-3
Prop Location: 3 COLONIAL VILLAGE DR UNIT C3
Arlington, MA
Owner: LEE RICHARD
Co-Owner:
Mailing Address:
3 COLONIAL VILLAGE DR #3
ARLINGTON, MA 02474

Prop ID: 61.A-3-4
Prop Location: 3 COLONIAL VILLAGE DR UNIT C4
Arlington, MA
Owner: ARLINGTON COLONIAL LLC
Co-Owner:
Mailing Address:
26 SADDLE CLUB RD
LEXINGTON, MA 02420

Prop ID: 61.A-3-5
Prop Location: 3 COLONIAL VILLAGE DR UNIT C5
Arlington, MA
Owner: FENG DUANSI
Co-Owner:
Mailing Address:
3 COLONIAL VILLAGE DR #5
ARLINGTON, MA 02474

Prop ID: 61.A-3-6
Prop Location: 3 COLONIAL VILLAGE DR UNIT C6
Arlington, MA
Owner: THAMES THOMAS L
Co-Owner: THAMES ELLEN M
Mailing Address:
3 COLONIAL VILLAGE DR #6
ARLINGTON, MA 02474

Prop ID: 61.A-3-7
Prop Location: 3 COLONIAL VILLAGE DR UNIT C7
Arlington, MA
Owner: CAMERON MELANIE
Co-Owner:
Mailing Address:
9 PRINCETON ROAD
ARLINGTON, MA 02474

Prop ID: 61.A-3-8
Prop Location: 3 COLONIAL VILLAGE DR UNIT C8
Arlington, MA
Owner: WANG ROBERT T & KATHY K/TRS
Co-Owner: WANG REALTY TRUST
Mailing Address:
402 HEATHER RD
LYNNFIELD, MA 01940

Prop ID: 61.A-3-9
Prop Location: 3 COLONIAL VILLAGE DR UNIT C9
Arlington, MA
Owner: LARSEN DAVID L
Co-Owner:
Mailing Address:
14 WESTERN AVE UNIT 2
GLOUCESTER, MA 01930

Prop ID: 61.A-4-1
Prop Location: 4 COLONIAL VILLAGE DR UNIT D1
Arlington, MA
Owner: JUNG JONATHAN
Co-Owner:
Mailing Address:
4 COLONIAL VILLAGE DR #1
ARLINGTON, MA 02474

Prop ID: 61.A-4-10
Prop Location: 4 COLONIAL VILLAGE DR UNIT D10
Arlington, MA
Owner: THOMPSON JOHN R & JUDITH
Co-Owner:
Mailing Address:
20 CONNOLLY RD
BILLERICA, MA 01821

Prop ID: 61.A-4-11
Prop Location: 4 COLONIAL VILLAGE DR UNIT D11
Arlington, MA
Owner: ONEIL EMILY
Co-Owner:
Mailing Address:
4 COLONIAL VILLAGE DR #11
ARLINGTON, MA 02474

Prop ID: 61.A-4-12
Prop Location: 4 COLONIAL VILLAGE DR UNIT D12
Arlington, MA
Owner: COMMONWEALTH BOSTON REALTY LLC
Co-Owner:
Mailing Address:
111 PERKINS STREET #192
JAMAICA PLAIN, MA 02130

Prop ID: 61.A-4-2
Prop Location: 4 COLONIAL VILLAGE DR UNIT D2
Arlington, MA
Owner: COLONIAL VILLAGE CONDOMINIUM
Co-Owner: TRUST
Mailing Address:
C/O DEPT 368 FIRST REALTY MANAGEMENT COR
PO BOX 4579
HOUSTON, TX 77210-4579

Prop ID: 61.A-4-3
Prop Location: 4 COLONIAL VILLAGE DR UNIT D3
Arlington, MA
Owner: JOHNSON CARL R
Co-Owner:
Mailing Address:
75 WILSON RD
BEDFORD, MA 01730

Prop ID: 61.A-4-4
Prop Location: 4 COLONIAL VILLAGE DR UNIT D4
Arlington, MA
Owner: SHIEH TONY TUNG HSIEN
Co-Owner: CHAN WING CHI
Mailing Address:
50 CHANDLER RD
BURLINGTON, MA 01803

Prop ID: 61.A-4-5
Prop Location: 4 COLONIAL VILLAGE DR UNIT D5
Arlington, MA
Owner: JENNINGS LAURIE/TRUSTEE
Co-Owner: SANDRA L FJELD 2017 IRREVOCABL
Mailing Address:
4 COLONIAL VILLAGE DR #5
ARLINGTON, MA 02474

Prop ID: 61.A-4-6
Prop Location: 4 COLONIAL VILLAGE DR UNIT D6
Arlington, MA
Owner: MANANDHAR ANILA
Co-Owner:
Mailing Address:
2 ST MARY`S RD
BURLINGTON, MA 01803

Prop ID: 61.A-4-7
Prop Location: 4 COLONIAL VILLAGE DR UNIT D7
Arlington, MA
Owner: PHAM GIANG T M
Co-Owner:
Mailing Address:
4 COLONIAL VILLAGE DR #7
ARLINGTON, MA 02474

Prop ID: 61.A-4-8
Prop Location: 4 COLONIAL VILLAGE DR UNIT D8
Arlington, MA
Owner: XIE CHAO
Co-Owner: YAN MINGLI
Mailing Address:
47 SOMERSET RD
LEXINGTON, MA 02420

Prop ID: 61.A-4-9
Prop Location: 4 COLONIAL VILLAGE DR UNIT D9
Arlington, MA
Owner: KIM MYUNG HEE
Co-Owner:
Mailing Address:
131 COOLIDGE AVE UNIT 128
WATERTOWN, MA 02472-2847

Prop ID: 61.A-5-1
Prop Location: 5 COLONIAL VILLAGE DR UNIT E1
Arlington, MA
Owner: LEXINGTON REALTY HOLDINGS LLC
Co-Owner:
Mailing Address:
PO BOX 134
LEXINGTON, MA 02420

Prop ID: 61.A-5-10
Prop Location: 5 COLONIAL VILLAGE DR UNIT E10
Arlington, MA
Owner: OCALLAGHAN KELLY &
Co-Owner: SCHNEIDER BRENDYN
Mailing Address:
5 COLONIAL VILLAGE DR #10
ARLINGTON, MA 02474

Prop ID: 61.A-5-11
Prop Location: 5 COLONIAL VILLAGE DR UNIT E11
Arlington, MA
Owner: CHENG HUI
Co-Owner: WANG HUI
Mailing Address:
5 COLONIAL VILLAGE DR #11
ARLINGTON, MA 02474

Prop ID: 61.A-5-12
Prop Location: 5 COLONIAL VILLAGE DR UNIT E12
Arlington, MA
Owner: HUANG GRACE
Co-Owner:
Mailing Address:
5 COLONIAL VILLAGE DR #12
ARLINGTON, MA 02476

Prop ID: 61.A-5-2
Prop Location: 5 COLONIAL VILLAGE DR UNIT E2
Arlington, MA
Owner: COLARUSSO PROPERTIES LLC
Co-Owner:
Mailing Address:
22 MILL ST SUITE 305
ARLINGTON, MA 02476

Prop ID: 61.A-5-3
Prop Location: 5 COLONIAL VILLAGE DR UNIT E3
Arlington, MA
Owner: SMITH IRENE H
Co-Owner:
Mailing Address:
5 COLONIAL VILLAGE DR #3
ARLINGTON, MA 02474

Prop ID: 61.A-5-4
Prop Location: 5 COLONIAL VILLAGE DR UNIT E4
Arlington, MA
Owner: JAIN SUJIT G
Co-Owner: GOLECHA PRATIBHA S
Mailing Address:
30 APPLETON PL UNIT 2
ARLINGTON, MA 02476

Prop ID: 61.A-5-5
Prop Location: 5 COLONIAL VILLAGE DR UNIT E5
Arlington, MA
Owner: WU PHILIP C
Co-Owner:
Mailing Address:
10 BROADWAY PL APT 3
SOMERVILLE, MA 02145

Prop ID: 61.A-5-6
Prop Location: 5 COLONIAL VILLAGE DR UNIT E6
Arlington, MA
Owner: GROSS GERALDINE R
Co-Owner:
Mailing Address:
5 COLONIAL VILLAGE DR #6
ARLINGTON, MA 02474

Prop ID: 61.A-5-7
Prop Location: 5 COLONIAL VILLAGE DR UNIT E7
Arlington, MA
Owner: AHMARI SOHRAB
Co-Owner:
Mailing Address:
5 COLONIAL VILLAGE DR #7
ARLINGTON, MA 02474

Prop ID: 61.A-5-8
Prop Location: 5 COLONIAL VILLAGE DR UNIT E8
Arlington, MA
Owner: MASKEY ANURAG
Co-Owner: SHRESTHA SHACHI
Mailing Address:
47 WALLACE ST
NEWTON HIGHLANDS, MA 02461

Prop ID: 61.A-5-9
Prop Location: 5 COLONIAL VILLAGE DR UNIT E9
Arlington, MA
Owner: LAWSON MARTHA A
Co-Owner:
Mailing Address:
70 MT VERNON ST
HAVERHILL, MA 01830

Prop ID: 61.A-6-1
Prop Location: 6 COLONIAL VILLAGE DR UNIT F1
Arlington, MA
Owner: MENDEZ VICTOR F
Co-Owner:
Mailing Address:
11 RICHARDSON RD
STONEHAM, MA 02180

Prop ID: 61.A-6-10
Prop Location: 6 COLONIAL VILLAGE DR UNIT F10
Arlington, MA
Owner: WOLFE DANIEL P
Co-Owner:
Mailing Address:
6 COLONIAL VILLAGE DR #10
ARLINGTON, MA 02474

Prop ID: 61.A-6-11
Prop Location: 6 COLONIAL VILLAGE DR UNIT F11
Arlington, MA
Owner: HARRIS JEFFREY M
Co-Owner:
Mailing Address:
6 COLONIAL VILLAGE DR #11
ARLINGTON, MA 02474

Prop ID: 61.A-6-12
Prop Location: 6 COLONIAL VILLAGE DR UNIT F12
Arlington, MA
Owner: LEE FONG-CHANG
Co-Owner: LEE SHIU-IN
Mailing Address:
C/O JOSEPH LEE
1531 LUDINGTON AVE
WESLEY CHAPEL, FL 33543

Prop ID: 61.A-6-2
Prop Location: 6 COLONIAL VILLAGE DR UNIT F2
Arlington, MA
Owner: CATALDI MAUREEN
Co-Owner:
Mailing Address:
6 COLONIAL VILLAGE DR UNIT 2
ARLINGTON, MA 02474

Prop ID: 61.A-6-3
Prop Location: 6 COLONIAL VILLAGE DR UNIT F3
Arlington, MA
Owner: RANNEY ROGER ERIC
Co-Owner:
Mailing Address:
6 COLONIAL VILLAGE DR #3
ARLINGTON, MA 02474

Prop ID: 61.A-6-4
Prop Location: 6 COLONIAL VILLAGE DR UNIT F4
Arlington, MA
Owner: MEI KATHY XIUWEN
Co-Owner:
Mailing Address:
32 ARCOLA ST
LEXINGTON, MA 02420

Prop ID: 61.A-6-5
Prop Location: 6 COLONIAL VILLAGE DR UNIT F5
Arlington, MA
Owner: SHENG JIANXIONG &
Co-Owner: LIU WENYING
Mailing Address:
6 COLONIAL VILLAGE DR #5
ARLINGTON, MA 02474

Prop ID: 61.A-6-6
Prop Location: 6 COLONIAL VILLAGE DR UNIT F6
Arlington, MA
Owner: BRIGHTMAN HELEN A ETAL/TRUSTEE
Co-Owner: BRIGHTMAN NOMINEE REALTY TRUST
Mailing Address:
13 EDSON ST
NASHUA, NH 03064

Prop ID: 61.A-6-7
Prop Location: 6 COLONIAL VILLAGE DR UNIT F7
Arlington, MA
Owner: MACAULEY LYNNE A
Co-Owner:
Mailing Address:
6 COLONIAL VILLAGE DR #7
ARLINGTON, MA 02474

Prop ID: 61.A-6-8
Prop Location: 6 COLONIAL VILLAGE DR UNIT F8
Arlington, MA
Owner: ZHANG YANFANG
Co-Owner: CUI JIKE
Mailing Address:
78 MAPLE ST
BELMONT, MA 02478

Prop ID: 61.A-6-9
Prop Location: 6 COLONIAL VILLAGE DR UNIT F9
Arlington, MA
Owner: PERKINS ELLIOTT W & ANITA C
Co-Owner: TRS/ PERKINS FAMILY TRUST
Mailing Address:
17 STEEPLE CHASE CIRCLE
WESTFORD, MA 01886

Prop ID: 61.A-7-1
Prop Location: 7 COLONIAL VILLAGE DR UNIT G1
Arlington, MA
Owner: LAMB MARTHA
Co-Owner:
Mailing Address:
7 COLONIAL VILLAGE DR #1
ARLINGTON, MA 02474

Prop ID: 61.A-7-10
Prop Location: 7 COLONIAL VILLAGE DR UNIT G10
Arlington, MA
Owner: GIOVINAZZO EMMA
Co-Owner:
Mailing Address:
7 COLONIAL VILLAGE DR #10
ARLINGTON, MA 02474

Prop ID: 61.A-7-11
Prop Location: 7 COLONIAL VILLAGE DR UNIT G11
Arlington, MA
Owner: MUSE CAROLYN M & JAMES A
Co-Owner:
Mailing Address:
1 PONDEROSA DR
PELHAM, NH 03076

Prop ID: 61.A-7-12
Prop Location: 7 COLONIAL VILLAGE DR UNIT G12
Arlington, MA
Owner: AUSTIN ALEXANDER B
Co-Owner:
Mailing Address:
7 COLONIAL VILLAGE DR #12
ARLINGTON, MA 02474

Prop ID: 61.A-7-2
Prop Location: 7 COLONIAL VILLAGE DR UNIT G2
Arlington, MA
Owner: JANTZ JOAN E
Co-Owner:
Mailing Address:
7 COLONIAL VILLAGE DR #2
ARLINGTON, MA 02474

Prop ID: 61.A-7-3
Prop Location: 7 COLONIAL VILLAGE DR UNIT G3
Arlington, MA
Owner: FARRELL MICHAEL W
Co-Owner: STEIN BRITTANY T
Mailing Address:
7 COLONIAL VILLAGE DR #3
ARLINGTON, MA 02474

Prop ID: 61.A-7-4
Prop Location: 7 COLONIAL VILLAGE DR UNIT G4
Arlington, MA
Owner: MAUGEL NATHAN/JENNIFER
Co-Owner:
Mailing Address:
60 MUNROE DR
EAST HAMPSTEAD, NH 03826

Prop ID: 61.A-7-5
Prop Location: 7 COLONIAL VILLAGE DR UNIT G5
Arlington, MA
Owner: SHIU PLACID K
Co-Owner:
Mailing Address:
19 GRANT PL
LEXINGTON, MA 02420

Prop ID: 61.A-7-6
Prop Location: 7 COLONIAL VILLAGE DR UNIT G6
Arlington, MA
Owner: MAHER DAVID F/TRUSTEE
Co-Owner: 7 COLONIAL TRUST
Mailing Address:
966 BROADWAY
SOMERVILLE, MA 02144

Prop ID: 61.A-7-7
Prop Location: 7 COLONIAL VILLAGE DR UNIT G7
Arlington, MA
Owner: SIEGEL JULES
Co-Owner:
Mailing Address:
1010 WALTHAM ST APT 295
LEXINGTON, MA 02421

Prop ID: 61.A-7-8
Prop Location: 7 COLONIAL VILLAGE DR UNIT G8
Arlington, MA
Owner: ZHANG ZHENZHEN &
Co-Owner: CHEN KUN
Mailing Address:
58 CRESTVIEW RD
BELMONT, MA 02478

Prop ID: 61.A-7-9
Prop Location: 7 COLONIAL VILLAGE DR UNIT G9
Arlington, MA
Owner: SWARTS HEIDI
Co-Owner:
Mailing Address:
7 COLONIAL VILLAGE DR #9
ARLINGTON, MA 02474

Prop ID: 61.A-8-1
Prop Location: 8 COLONIAL VILLAGE DR UNIT H1
Arlington, MA
Owner: LEXINGTON REALTY HOLDINGS LLC
Co-Owner:
Mailing Address:
PO BOX 134
LEXINGTON, MA 02420

Prop ID: 61.A-8-10
Prop Location: 8 COLONIAL VILLAGE DR UNIT H10
Arlington, MA
Owner: JONAS MICHAEL
Co-Owner:
Mailing Address:
8 COLONIAL VILLAGE DR #10
ARLINGTON, MA 02476

Prop ID: 61.A-8-11
Prop Location: 8 COLONIAL VILLAGE DR UNIT H11
Arlington, MA
Owner: RAHMATPOUR SOHAILA--ETAL
Co-Owner: NAKHAEE HAMID
Mailing Address:
20 OVERBROOK DRIVE
WELLESLEY, MA 02482

Prop ID: 61.A-8-12
Prop Location: 8 COLONIAL VILLAGE DR UNIT H12
Arlington, MA
Owner: MILLER CHERYL S
Co-Owner:
Mailing Address:
8 COLONIAL VILLAGE DR #12
ARLINGTON, MA 02474

Prop ID: 61.A-8-2
Prop Location: 8 COLONIAL VILLAGE DR UNIT H2
Arlington, MA
Owner: KNIGHT WILL
Co-Owner:
Mailing Address:
8 COLONIAL VILLAGE DR #2
ARLINGTON, MA 02474

Prop ID: 61.A-8-3
Prop Location: 8 COLONIAL VILLAGE DR UNIT H3
Arlington, MA
Owner: ELANBRI NOUREDDINE
Co-Owner: AZMANI WAFA
Mailing Address:
8 COLONIAL VILLAGE DR #3
ARLINGTON, MA 02474

Prop ID: 61.A-8-4
Prop Location: 8 COLONIAL VILLAGE DR UNIT H4
Arlington, MA
Owner: NADJARIAN VATCHE
Co-Owner:
Mailing Address:
8 COLONIAL VILLAGE DR
UNIT 4
ARLINGTON, MA 02474

Prop ID: 61.A-8-5
Prop Location: 8 COLONIAL VILLAGE DR UNIT H5
Arlington, MA
Owner: KING ALLISON J
Co-Owner:
Mailing Address:
8 COLONIAL VILLAGE DR #5
ARLINGTON, MA 02474

Prop ID: 61.A-8-6
Prop Location: 8 COLONIAL VILLAGE DR UNIT H6
Arlington, MA
Owner: HUEY JEFFREY K
Co-Owner:
Mailing Address:
8 COLONIAL VILLAGE DR APT 6
ARLINGTON, MA 02474

Prop ID: 61.A-8-7
Prop Location: 8 COLONIAL VILLAGE DR UNIT H7
Arlington, MA
Owner: SHEEHAN KEVIN/ANDREA
Co-Owner:
Mailing Address:
228 FOX HILL RD
BURLINGTON, MA 01803

Prop ID: 61.A-8-8
Prop Location: 8 COLONIAL VILLAGE DR UNIT H8
Arlington, MA
Owner: RUSSO ANMARIE
Co-Owner:
Mailing Address:
8 COLONIAL VILLAGE DR #8
ARLINGTON, MA 02474

Prop ID: 61.A-8-9
Prop Location: 8 COLONIAL VILLAGE DR UNIT H9
Arlington, MA
Owner: LIU QING
Co-Owner: LI SHUANGLIAN
Mailing Address:
8 COLONIAL VILLAGE DR #9
ARLINGTON, MA 02474

Prop ID: 61.A-9-1
Prop Location: 9 COLONIAL VILLAGE DR UNIT I1
Arlington, MA
Owner: GOODWIN DESIREE
Co-Owner:
Mailing Address:
9 COLONIAL VILLAGE DR #1
ARLINGTON, MA 02474

Prop ID: 61.A-9-10
Prop Location: 9 COLONIAL VILLAGE DR UNIT I10
Arlington, MA
Owner: PRESTON DIANE
Co-Owner:
Mailing Address:
186 NEWPORT ST
ARLINGTON, MA 02476

Prop ID: 61.A-9-11
Prop Location: 9 COLONIAL VILLAGE DR UNIT I11
Arlington, MA
Owner: VALDETTARO VERONIQUE A
Co-Owner:
Mailing Address:
9 COLONIAL VILLAGE DR #11
ARLINGTON, MA 02474

Prop ID: 61.A-9-12
Prop Location: 9 COLONIAL VILLAGE DR UNIT I12
Arlington, MA
Owner: FLEMING ELLEN T
Co-Owner:
Mailing Address:
9 COLONIAL VILLAGE DR #12
ARLINGTON, MA 02474

Prop ID: 61.A-9-2
Prop Location: 9 COLONIAL VILLAGE DR UNIT 2
Arlington, MA
Owner: NEWMARK GERRY G
Co-Owner:
Mailing Address:
9 COLONIAL VILLAGE DR #2
ARLINGTON, MA 02474

Prop ID: 61.A-9-3
Prop Location: 9 COLONIAL VILLAGE DR UNIT I3
Arlington, MA
Owner: ELBANNAN SAMAA
Co-Owner:
Mailing Address:
39 PINE HILL RD
BEDFORD, MA 01730

Prop ID: 61.A-9-4
Prop Location: 9 COLONIAL VILLAGE DR UNIT I4
Arlington, MA
Owner: DONOVAN JOANNE
Co-Owner:
Mailing Address:
9 COLONIAL VILLAGE DR #14
ARLINGTON, MA 02474

Prop ID: 61.A-9-5
Prop Location: 9 COLONIAL VILLAGE DR UNIT I5
Arlington, MA
Owner: LAI RALPH W M & CINDY S T
Co-Owner:
Mailing Address:
28 CORNERSTONE CT
DOYLESTOWN, PA 18901

Prop ID: 61.A-9-6
Prop Location: 9 COLONIAL VILLAGE DR UNIT I6
Arlington, MA
Owner: WANG PINGLANG & YING
Co-Owner:
Mailing Address:
35 SKYLINE DR
STATEN ISLAND, NY 10304

Prop ID: 61.A-9-7
Prop Location: 9 COLONIAL VILLAGE DR UNIT I7
Arlington, MA
Owner: ZHANG YANFANG &
Co-Owner: CUI JIKE
Mailing Address:
78 MAPLE ST
BELMONT, MA 02478

Prop ID: 61.A-9-8
Prop Location: 9 COLONIAL VILLAGE DR UNIT I8
Arlington, MA
Owner: SHINGU IKUE
Co-Owner:
Mailing Address:
9 COLONIAL VILLAGE DR #8
ARLINGTON, MA 02474

Prop ID: 61.A-9-9
Prop Location: 9 COLONIAL VILLAGE DR UNIT I9
Arlington, MA
Owner: MAC INNES PATRICIA
Co-Owner:
Mailing Address:
32 ST CATHERINE RD
NORWOOD, MA 02062

Prop ID: 62-1-4.A
Prop Location: 16-38 DRAKE RD Arlington, MA
Owner: ARLINGTON HOUSING AUTHORITY
Co-Owner: DRAKE VILLAGE
Mailing Address:
730 MASS AVE
ARLINGTON, MA 02476

Prop ID: 85-1-7
Prop Location: 4 WESTMORELAND AVE Arlington, MA
Owner: CALLAGHAN OWEN & JESSICA
Co-Owner:
Mailing Address:
4 WESTMORELAND AVE
ARLINGTON, MA 02474

Prop ID: 85-1-8
Prop Location: 239 LOWELL ST Arlington, MA
Owner: VERDERESE JOHN T
Co-Owner:
Mailing Address:
239 LOWELL STREET
ARLINGTON, MA 02474

Prop ID: 85-1-9
Prop Location: 243 LOWELL ST Arlington, MA
Owner: WYATT PATRICIA L
Co-Owner:
Mailing Address:
243 LOWELL STREET
ARLINGTON, MA 02474

Prop ID: 85-4-14
Prop Location: 3 WESTMORELAND AVE Arlington, MA
Owner: ENG DAVID H
Co-Owner: CANTY ANDREA M
Mailing Address:
3 WESTMORELAND AVE
ARLINGTON, MA 02474

Prop ID: 85-4-15
Prop Location: 221 LOWELL ST Arlington, MA
Owner: LAMONT STUART & BARBARA
Co-Owner:
Mailing Address:
221 LOWELL STREET
ARLINGTON, MA 02474

Prop ID: 85-4-16
Prop Location: 219 LOWELL ST Arlington, MA
Owner: SMITH ROBERT G & JANE R
Co-Owner:
Mailing Address:
219 LOWELL STREET
ARLINGTON, MA 02474

Prop ID: 85-4-21
Prop Location: 7 WEST COURT TERR Arlington, MA
Owner: STROK GAVIN M
Co-Owner: STROK MARIE-CAROLINE
Mailing Address:
7 WEST COURT TERR
ARLINGTON, MA 02474

Prop ID: 85-4-22
Prop Location: 207 LOWELL ST Arlington, MA
Owner: MARTENS CHINA L
Co-Owner: MARTENS SIEGFRIED
Mailing Address:
207 LOWELL STREET
ARLINGTON, MA 02474

Prop ID: 85-4-23
Prop Location: 203 LOWELL ST Arlington, MA
Owner: SALOCKS JEFFREY D--ETAL
Co-Owner: STAFFORD SHARON L
Mailing Address:
203 LOWELL STREET
ARLINGTON, MA 02474

Prop ID: 85-4-26
Prop Location: 197 LOWELL ST Arlington, MA
Owner: GETTLER JUSTIN B & HOLLY K
Co-Owner:
Mailing Address:
197 LOWELL ST
ARLINGTON, MA 02474

Prop ID: 86-5-10.A
Prop Location: 255 LOWELL ST Arlington, MA
Owner: GALVIN ANNE M
Co-Owner:
Mailing Address:
255 LOWELL ST
ARLINGTON, MA 02474

Prop ID: 86-5-10.B
Prop Location: 0-LOT LOWELL ST Arlington, MA
Owner: PLANT SUSAN W
Co-Owner: CHO DANYUL Y
Mailing Address:
257 LOWELL STREET
ARLINGTON, MA 02474

Prop ID: 86-5-11
Prop Location: 257 LOWELL ST Arlington, MA
Owner: PLANT SUSAN W
Co-Owner: CHO DANYUL Y
Mailing Address:
257 LOWELL STREET
ARLINGTON, MA 02474

Prop ID: 86-5-12
Prop Location: 261 LOWELL ST Arlington, MA
Owner: SOUCY PAUL EDWARD
Co-Owner: SILVERMAN MELANIE TIA
Mailing Address:
261 LOWELL STREET
ARLINGTON, MA 02474

Prop ID: 86-5-13
Prop Location: 265 LOWELL ST Arlington, MA
Owner: CHARLIER-MATTHEWS REBECCA
Co-Owner: KOSMATKA KRISTOPHER
Mailing Address:
265 LOWELL ST
ARLINGTON, MA 02474

Prop ID: 86-5-14
Prop Location: 269 LOWELL ST Arlington, MA
Owner: CANADAY JOHN T
Co-Owner:
Mailing Address:
269 LOWELL ST
ARLINGTON, MA 02474

Prop ID: 86-5-15
Prop Location: 271 LOWELL ST Arlington, MA
Owner: GEISSLER GARY J
Co-Owner:
Mailing Address:
1 LOWELL STREET
LEXINGTON, MA 02420

Prop ID: 86-5-9
Prop Location: 251 LOWELL ST Arlington, MA
Owner: ALLEN THOMAS J &
Co-Owner: SENESE MARGARET D
Mailing Address:
251 LOWELL STREET
ARLINGTON, MA 02474

Notification to Abutters Under the Massachusetts Wetlands Protection Act and Arlington Wetlands Protection Bylaw

In accordance with the second paragraph of Massachusetts General Laws Chapter 131, Section 40, and the Arlington Wetlands Protection Bylaw, you are hereby notified of the following:

The Conservation Commission will hold a public hearing on Thursday, December 17, 2020 at 7:30pm in accordance with the provisions of the Mass. Wetlands Protection Act (M.G.L. Ch. 131, s. 40, as amended) and the Town of Arlington By-Laws Article 8, By-Law for Wetland Protection, for a Notice of Intent from the Town of Arlington Parks & Recreation Commission, for the Arlington Reservoir Renovation Project Phase II, which includes parking area improvements, installation of new ADA-accessible pathways, new recreational facilities, a boat launch, bathing beach improvements, bank stabilization measures, and invasive species control / upland habitat restoration at the Arlington Reservoir, within regulated wetland resource areas and buffer zones, on Assessor's Property Map/Lot 61-1-4 in Arlington. *Due to COVID-19, please refer to the town website for information on the location of the meeting or virtual (Zoom) meeting information. Conservation Commission agendas are posted on their website at least 48 hours in advance at: https://www.arlingtonma.gov/town-governance/boards-and-committees/conservation-commission.*

A copy of the application and accompanying plans are available for inspection Mon. - Fri. 8am-noon at the Conservation Commission office, first floor of the Town Hall Annex, 730 Massachusetts Avenue and by request via email at Rebecca.weissman@swca.com. *(Please note that the town hall may be closed or office hours reduced due to COVID-19 concerns).*

For more information call the Town of Arlington Parks and Recreation Commission at 781-316-3880 or the Arlington Conservation Commission at 781-316-3012, or the DEP Northeast Regional Office, 978-694-3200.

NOTE: Notice of the Public Hearing will be published at least five (5) days in advance in *The Arlington Advocate* and be posted not less than 48 hours in advance in the Arlington Town Hall of the public hearing.

AFFIDAVIT OF SERVICE
(Return to Conservation Commission)

I, Becky Barber, being duly sworn, do hereby state as follows: on December 3, 2020, I mailed a "Notification to Abutters" in compliance with the second paragraph of Massachusetts General Laws, Chapter 131, s.40, the DEP Guide to Abutter Notification dated April 8, l994, and the Arlington Wetlands Protection Bylaw, Title V, Article 8 of the Town of Arlington Bylaws in connection with the following matter: A Notice of Intent

The form of the notification, and a list of the abutters to whom it was provided and their addresses, are attached to this Affidavit of Service.
Signed under the pains and penalties of perjury, this 3rd day of December, 2020.

Becky Barber

Name

APPENDIX B

Figures

MASTER PLANNING IMPLEMENTATION FOR ARLINGTON RESERVOIR RECREATION AREA

Figure 1
USGS Topo

Project Area

Middlesex County, MA
USGS 7.5' Quadrangle:
Lexington, MA, 42071-D2
NAD 1983 State Plane
Massachusetts Mainland
FIPS 2001 Feet
71.1888°W 42.4295°N

Base Map: ESRI ArcGIS Online, accessed November 2020

Updated: 11/6/2020
Project No. 60780
File: 60780 Figure 1 USGS Topo

N
1:24,000

Massachusetts

0 1,000 2,000 Feet
0 250 500 Meters

SWCA
ENVIRONMENTAL CONSULTANTS

MASTER PLANNING IMPLEMENTATION FOR ARLINGTON RESERVOIR RECREATION AREA

Figure 2
Aerial Map

SWCA
ENVIRONMENTAL CONSULTANTS

Project Area

Municipal Protected and Open Space

Private Protected and Open Space

Parcel

Middlesex County, MA
USGS 7.5' Quadrangle:
Lexington, MA, 42071-D2
NAD 1983 State Plane
Massachusetts Mainland
FIPS 2001 Feet
71.1888°W 42.4295°N

Base Map: ESRI ArcGIS Online, accessed November 2020

Updated: 11/12/2020
Project No. 60780
File: 60780 Figure 2 Environmental

N

1:5,000

Massachusetts

0 200 400 Feet

0 50 100 Meters

APPENDIX C

Site Photographs

All photographs taken July 17, 2020

Photo 1: Bathing Beach

Photo 2. Swim Area with Embankment on left.

Photo 3. Embankment. The surface is proposed to be improved for walking, and invasive species, including poison ivy to be removed.

All photographs taken July 17, 2020

Photo 4: Existing gravel parking lot. It is proposed to rebuild the parking lot with permeable materials to improve water quality in the Res.

Photo 5. Bank and slope erosion from parking lot overland runoff. The banks are proposed to be restored, and the stormwater will be infiltrated.

Photo 6. Typical bank and slope erosion along the Res. These areas are proposed to be restored and re-vegetated.

All photographs taken July 17, 2020

Photo 7: Existing Walking Path in Arlington proposed to be rebuilt and the adjacent bank/slopes restored.

Photo 8. Existing walking path in Lexington. Vegetation is dominated by invasive species proposed to be controlled.

Photo 9. Areas of significant bank erosion are proposed to be restored in the first phase of site work (west side of Res near Rindge Park).

APPENDIX D

Project Plans
(Under Separate Cover)

APPENDIX E

Stormwater Report
(Under Separate Cover)

TOWN OF ARLINGTON

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

100% DESIGN DEVELOPMENT SET

DRAWING LIST

G	COVER SHEET
L0	KEY PLAN
L1.1 – L1.5	SITE PREPARATION AND DEMO PLANS
L2.1 – L2.5	LAYOUT AND MATERIAL PLANS
L3.1 – L3.5	GRADING PLANS
L4.1 – L4.5	PLANTING PLANS
LD1.1 – LD1.9	LANDSCAPE DETAILS
C1.0	CIVIL DRAINAGE PLAN
C2.0	CIVIL DETAIL SHEETS
1.0	PROPOSED BANK RESTORATION AREAS
2.0	PROPOSED AREAS OF PHASE1 BANK RESTORATION
3.0	BANK RESTORATION SECTIONS
4.0	BANK RESTORATION DETAILS
5.0	BANK RESTORATION DETAILS AND NOTES

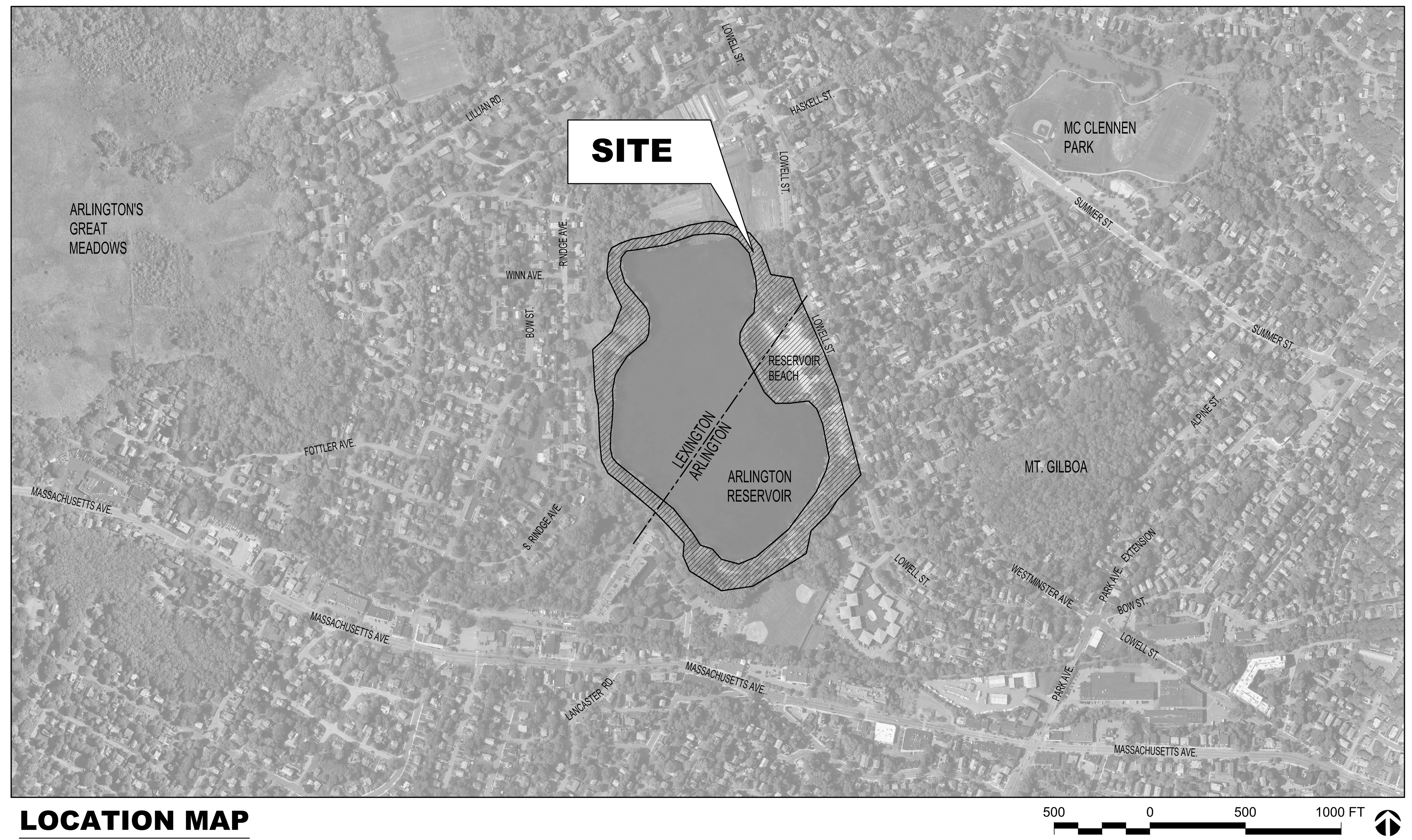
PREPARED BY:

LANDSCAPE ARCHITECT:
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street, Suite 202
Boston, MA 02108
617-451-1018 Tel
www. kylezick.com

ARCHITECT:
Bargmann Hendrie + Archetype, Inc.
9 Channel Center Street #300, Boston, MA 02210
617-350-0450 Tel
617-350-0215 Fax

CIVIL ENGINEER:
Woodard & Curran, Inc.
980 Washington Street #325, Dedham, MA 02026
800-446-5518 Tel

ENVIRONMENTAL CONSULTING:
SWCA Environmental Consultants
15 Research Drive, Amherst, MA 01002
413-575-9883 Tel



LOCATION MAP
Lowell Street/Arlington Reservoir
Arlington, MA

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE

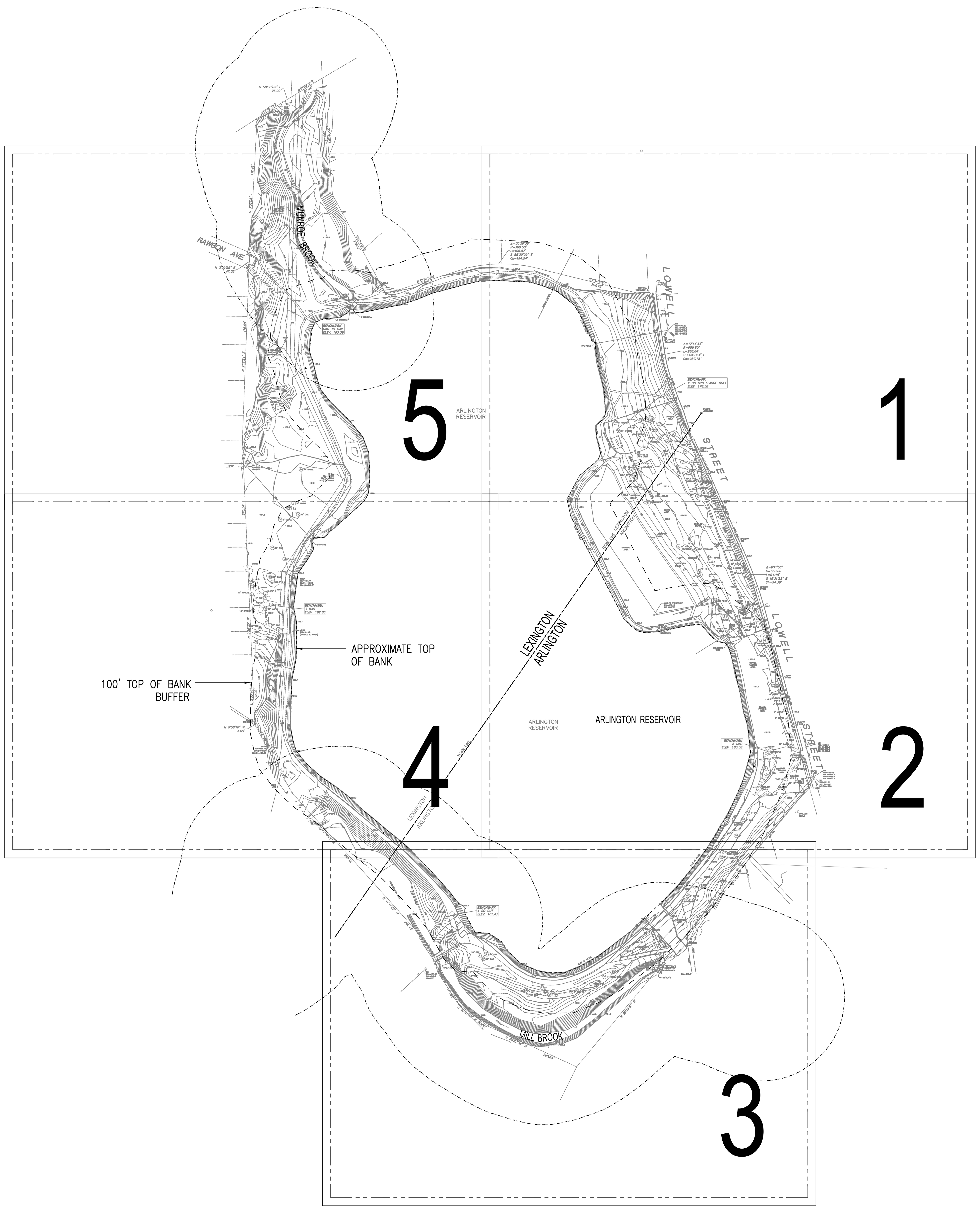
kzla
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202 617 451-1018 Tel
Boston, MA 02108 www.kylezick.com

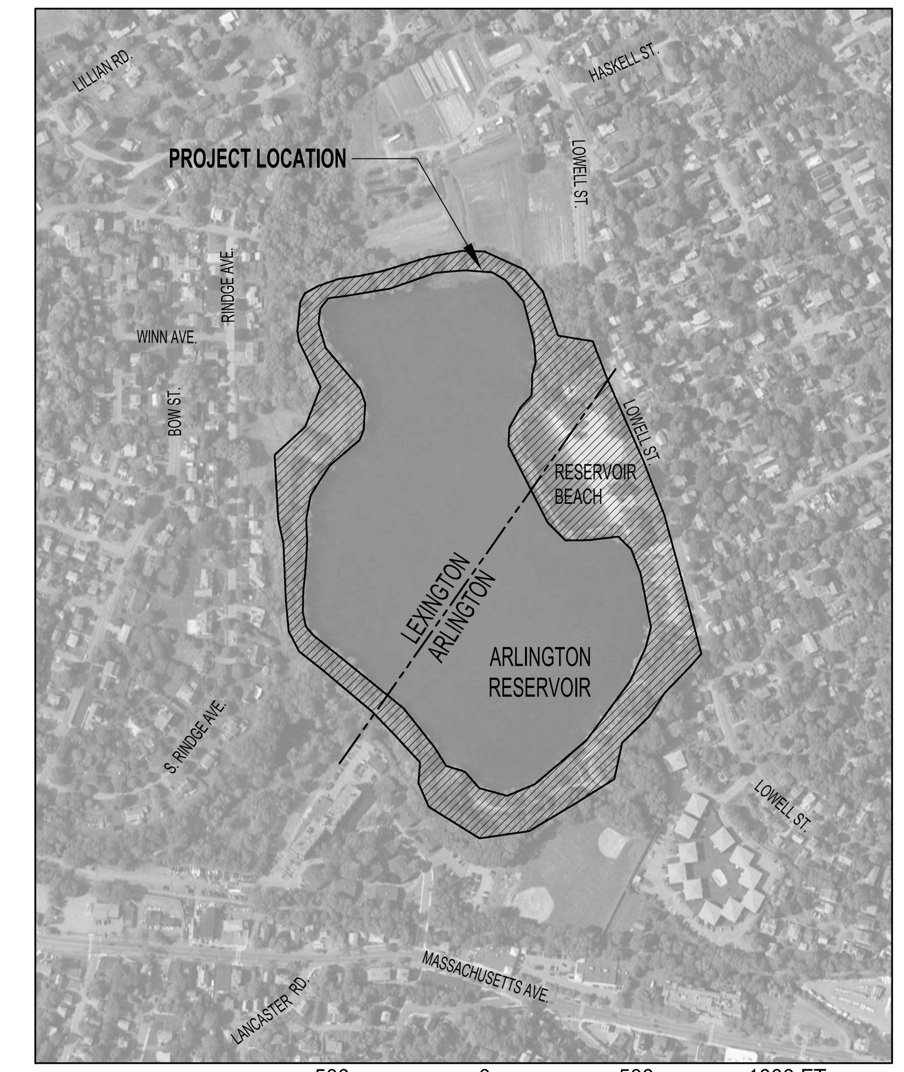
100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: N/A
Drawing Title:

COVER SHEET

G





LOCUS MAP 500 0 500 1000 FT

GENERAL NOTES:

1. CONTRACTOR SHALL BE FAMILIAR WITH DRAWINGS AND SPECIFICATIONS BEFORE BIDDING
2. DRAWINGS SHALL SUPERSEDE SPECIFICATIONS FOR ANY DISCREPANCIES
3. CONTRACTOR SHALL CONFORM TO ALL FEDERAL, STATE AND LOCAL CODES, INCLUDING CMR521/ADA.
4. NO SMOKING IS ALLOWED WITHIN THE PARK AT ANY TIME
5. SURVEY WAS PERFORMED BY WESTON & SAMPSON ENGINEERS, INC. OF ALBANY, NY WAS UNDERTAKEN IN DECEMBER 2017
6. PER THE STORMWATER POLLUTION PREVENTION PLAN (DATED 11/9/2020), THE CONTRACTOR CAN NOT DISTURB MORE THAN 5 ACRES AT ANY GIVEN TIME.

LEGEND

- APPROXIMATE TOP OF BANK
- 100' TOP OF BANK BUFFER
- 200' RIVERFRONT AREA

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE

kzla
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202
Boston, MA 02108
617 451-1018 Tel
www.kylezick.com

100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: AS SHOWN
Drawing Title:

KEY PLAN

L0

LEGEND

Symbol	Description
L.O.W.	LIMIT OF WORK
	CONSTRUCTION FENCE
	TREE PROTECTION -FENCING, TYP. (1 / LD1.1)
	TREE PROTECTION -WOOD BOARD, TYP. (4 / LD1.1)
	EROSION CONTROL -COMPOST SOCK, TYP. (2 / LD1.1)
	SAWCUT LINE, TYP.
	SILT SACK INLET PROTECTION (3 / LD1.1)
	LIGHT POST TO REMAIN AND BE PROTECTED, TYP.
	INVASIVE MANAGEMENT AREA
	GRANITE MILE MARKER
	APPROXIMATE TOP OF BANK
	100' TOP OF BANK BUFFER
24"	REMOVE TREE OR SHRUB, TYP. (SIZE, DBH)
24"	REMOVE INVASIVE TREE OR SHRUB (SIZE, DBH)
24"	PRUNE TREE, (SIZE, DBH)
R&D	REMOVE AND DISPOSE
R&S	REMOVE AND STOCKPILE
R&R	REMOVE AND RESET
	200' RIVERFRONT AREA
	REMOVE AND DISPOSE 10" OF STONE DUST AND GRAVEL BASE
	REMOVE AND DISPOSE ASPHALT, TYP.
	REMOVE AND DISPOSE GRAVEL, TYP.
	STRIP AND STOCKPILE LOAM, TYP.
	CLEAR AND GRUB, TYP.
	AIRSPADE EXISTING PATH, TYP.
	EXCAVATE 9" OF EX. PATH, TYP. OR FOR PROPOSED PATH, TYP.
	SCARIFY STONEDUST PATH, TYP.

NOTE:
1. PROTECT STOCKPILED MATERIALS DURING CONSTRUCTION
2. ALL GRANITE BENCHES TO BE R&S FOR REUSE ON SITE; ALL GRANITE MILE MAKERS TO BE R&R
3. ALL WOOD SIGN POSTS, UNLESS OTHERWISE DESIGNATED, TO BE R&R

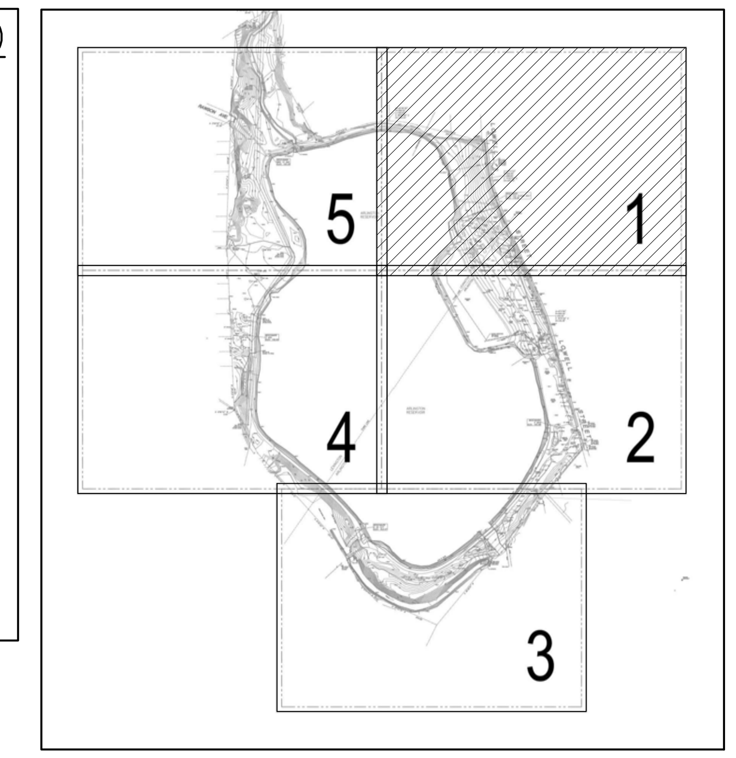
SITE PREPARATION AND DEMOLITION NOTES:

1. PRIOR TO COMMENCING ANY EXCAVATION WORK, THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES IN ACCORDANCE WITH THE "DIG SAFE" NOTIFICATION PROCEDURES PROMOTED BY RESPECTIVE UTILITY COMPANIES. THE DIG SAFE TELEPHONE NUMBER FOR MASSACHUSETTS IS 811.
2. PRIOR TO COMMENCING EARTHWORK, EROSION & SEDIMENTATION CONTROLS MUST BE IN PLACE, INCLUDING BUT NOT LIMITED TO COMPOST SOCKS AND SILT SACKS.
3. THE LOCATIONS OF ALL UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL CONTACT THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANY TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
4. ALL REFUSE, DEBRIS, AND MISCELLANEOUS ITEMS TO BE REMOVED, THAT ARE NOT TO BE STOCKPILED FOR LATER USE ON THE PROJECT OR DELIVERED TO THE OWNER, SHALL BE LEGALLY DISPOSED OF OFF-SITE BY THE CONTRACTOR.
5. ALL ITEMS REQUIRING REMOVAL SHALL BE REMOVED TO FULL DEPTH TO INCLUDE BASE MATERIAL AND FOOTINGS OR FOUNDATIONS AS APPLICABLE, AND REUSED AS DIRECTED BY THE OWNER OR LEGALLY DISPOSED OF OFF-SITE BY CONTRACTOR.
6. CONTRACTOR SHALL STRIP AND STOCKPILE EXISTING TOPSOIL TO FULL DEPTH WITHIN LIMIT OF GRADING BEFORE COMMENCING EXCAVATION AND GRADING OPERATIONS. TOPSOIL SHALL NOT BE REMOVED FROM THE SITE, UNLESS APPROVED BY THE LANDSCAPE ARCHITECT.
7. ALL MATERIALS THAT ARE TO BE STORED & STOCKPILED ON SITE THAT ARE LOOSE AND MAY WASH WITH RAIN EVENTS, ARE TO BE COVERED WITH A TARP AND/OR SURROUNDED WITH EROSION &SEDIMENT CONTROLS.
8. AT ALL LOCATIONS WHERE CONCRETE PAVEMENT OR BITUMINOUS CONCRETE ABUT NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAWCUT TO A CLEAN, SMOOTH EDGE.
9. BEFORE ANY TREE CLEARING OR PRUNING IS DONE, THE CONTRACTOR SHALL ARRANGE A CONFERENCE ON THE SITE WITH THE LANDSCAPE ARCHITECT AND TREE WARDEN TO IDENTIFY TREES WHICH ARE TO BE PRUNED, PROTECTED OR REMOVED. DO NO CLEARING OR PRUNING WITHOUT A CLEAR UNDERSTANDING OF EXISTING CONDITIONS TO BE PRESERVED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING TREES AND PLANTS DESIGNATED TO REMAIN FOR THE LENGTH OF THE CONSTRUCTION PERIOD. PROTECTION TO INCLUDE TRUNK, ROOTS, AND OVERHEAD BRANCHES. THE PLACEMENT OF PROTECTION DEVICES ADDITIONAL TO THOSE NOTED SHALL, HOWEVER, BE AT THE CONTRACTOR'S DISCRETION.
11. DAMAGE NO PLANTS TO REMAIN BY BURNING, PUMPING OF WATER, CUTTING OF LIVE ROOTS OR BRANCHES, OR BY ANY OTHER MEANS. NO PLANTS TO BE SAVED SHALL BE USED FOR CRANE STAYS, GUYS OR OTHER FASTENINGS. VEHICLES SHALL NOT BE PARKED WITHIN THE DRIP LINE OR WHERE DAMAGE MAY RESULT TO TREES TO BE SAVED. CONSTRUCTION MATERIALS SHALL NOT BE STORED BENEATH TREES TO BE SAVED.
12. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN PLANS AND ACTUAL CONDITIONS TO THE LANDSCAPE ARCHITECT PRIOR TO STARTING WORK.
13. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING CONDITIONS THAT ARE DUE TO CONTRACTOR OPERATIONS.
14. THE GENERAL CONTRACTOR SHALL MAINTAIN OR ADJUST TO NEW FINISH GRADE AS NECESSARY ALL UTILITY AND SITE STRUCTURES SUCH AS LIGHT POLES, SIGN POLES, MANHOLES, CATCH BASINS, HAND HOLES, WATER AND GAS GATES, HYDRANTS, ETC., FROM MAINTAINED UTILITY AND SITE SYSTEMS UNLESS OTHERWISE NOTED ON THE UTILITY DRAWINGS OR AS DIRECTED BY THE LANDSCAPE ARCHITECT.
15. THE GENERAL CONTRACTOR SHALL COORDINATE ALL ADJUSTMENT OR ABANDONMENT OF UTILITIES WITH THE RESPECTIVE UTILITY COMPANY.
16. ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS. ANY MUD ON PUBLIC WAYS ORIGINATING FROM THE JOB SITE SHALL BE CLEANED BY THE CONTRACTOR.
17. CONTRACTOR SHALL SECURE ALL PERMITS THAT MAY BE REQUIRED FROM ALL JURISDICTIONS AFFECTED BY THIS WORK.
18. CONTRACTOR'S EQUIPMENT AND VEHICLES SHALL BE PARKED ON PAVED SURFACES ONLY. NO PARKING ON TURF OR SAND AREAS.
19. CONTRACTOR CAN REQUEST TO UTILIZE ADDITIONAL STAGING AREAS WITHIN THE LIMIT OF WORK. ALL STAGING AREAS, AS SHOWN ON THE PLANS OR ADDITIONAL AREAS REQUESTED BY THE CONTRACTOR, SHALL PROVIDE PROTECTION OF THE GROUND PER THE SPECIFICATIONS. NO ADDITIONAL COST CAN BE REQUESTED FOR ADDITIONAL STAGING AREAS.
20. WITHIN THE LIMIT OF WORK, CONTRACTOR SHALL IDENTIFY ALL TREE LIMBS LOWER THAN 10' ABOVE THE GROUND SURFACE THAT MAY BE VULNERABLE TO EQUIPMENT DAMAGE. NOTIFY THE LANDSCAPE ARCHITECT PRIOR TO STARTING WORK BENEATH ANY OF THESE LIMBS. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO TREE LIMBS THAT ARE DUE TO CONTRACTOR OPERATIONS.
21. CONTRACTOR TO CLEAN ALL DRAINAGE STRUCTURES WITHIN LIMIT OF WORK BEFORE SITE WORK BEGINS, AND AT THE END OF THE PROJECT. CONTRACTOR TO PROVIDE SILT SACKS FOR ALL CATCH BASINS WITHIN LIMIT OF WORK. CONTRACTOR TO CLEAN ALL DRAINAGE PIPES CONNECTED TO ALL CATCH BASINS THAT ARE WITHIN THE LIMIT OF WORK.

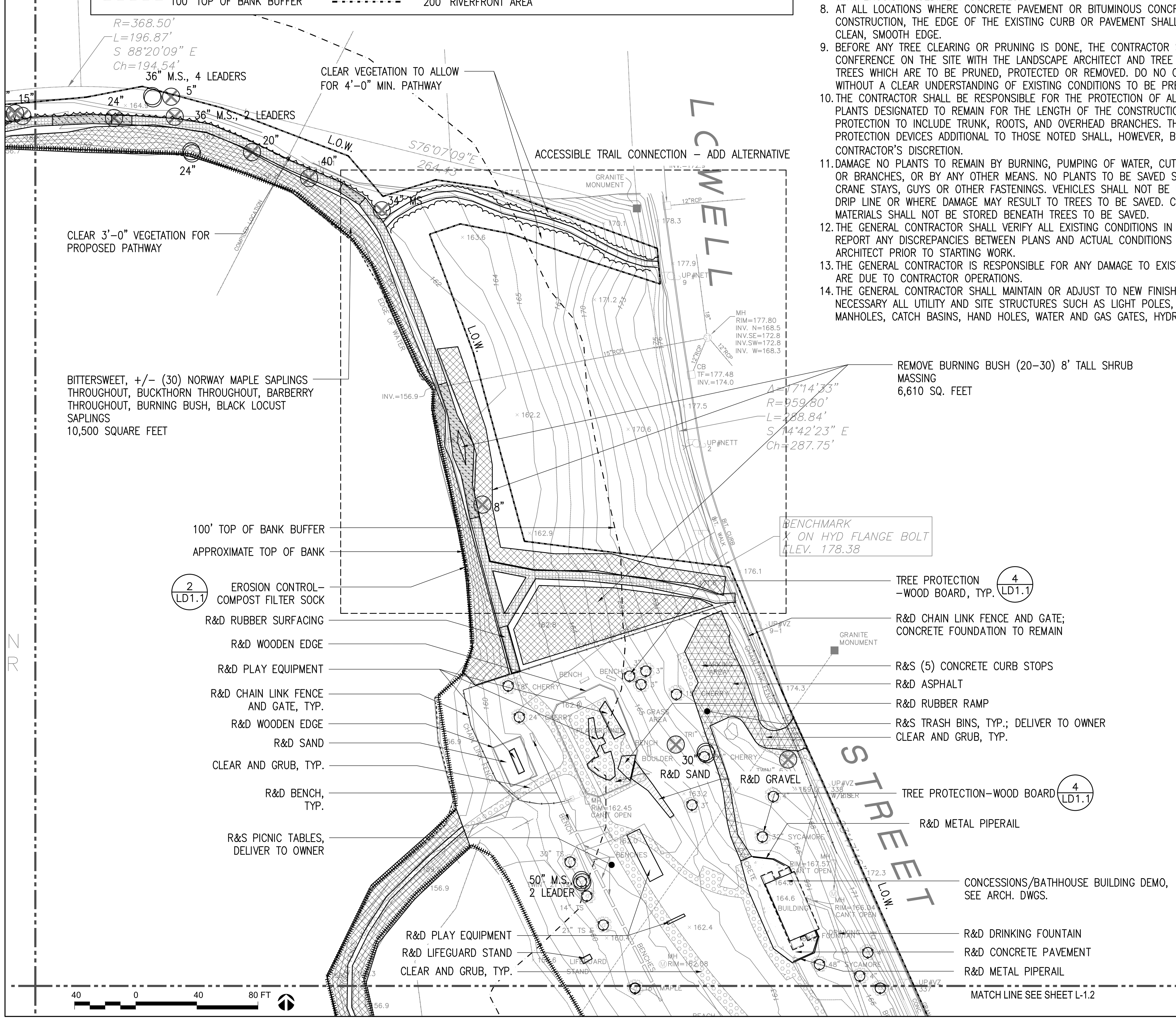
ARLINGTON TREE REMOVAL AND REPLACEMENT POLICY:

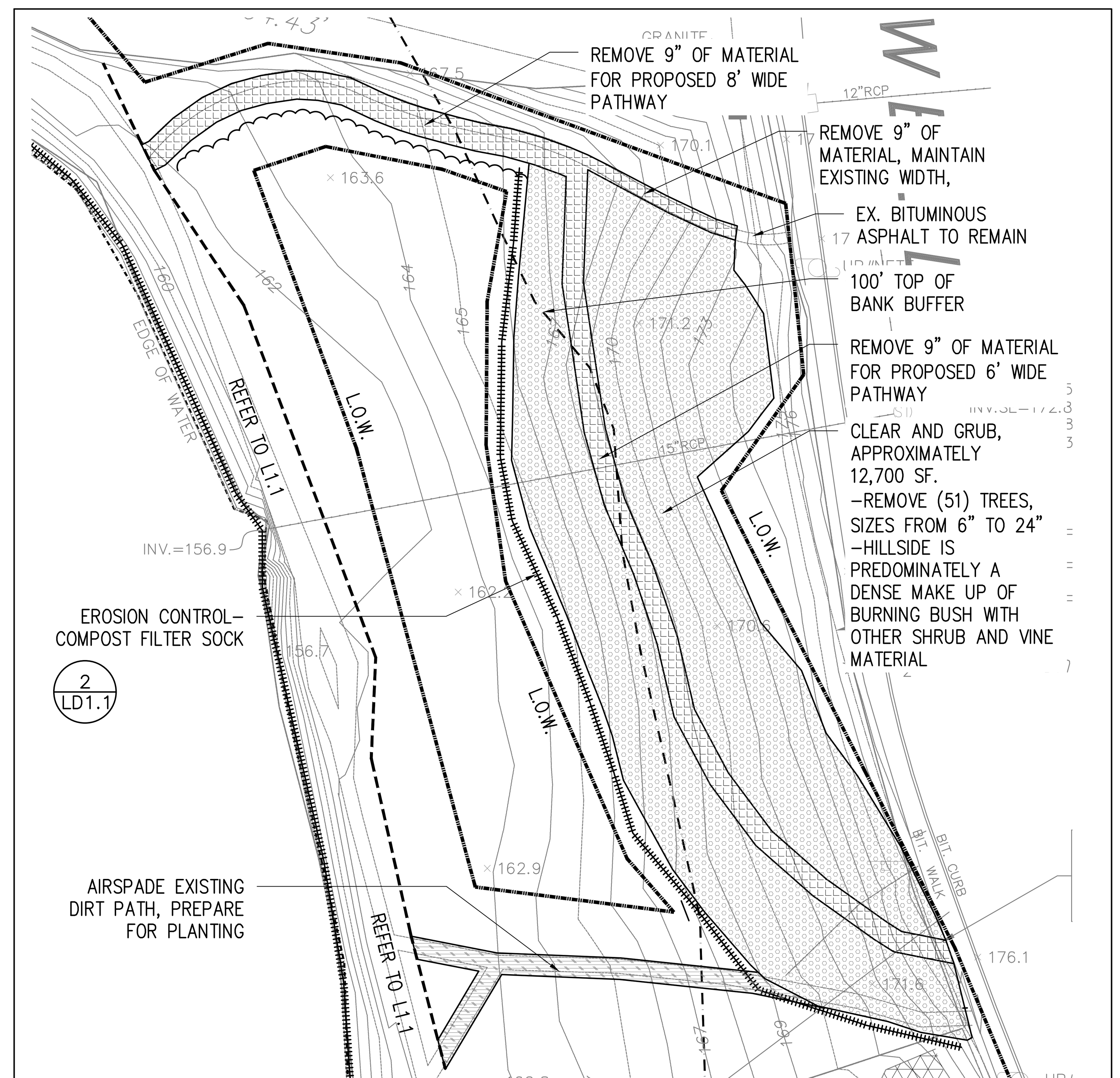
1. REMOVAL OF A 3-8" DBH TREE SHALL BE REPLACED WITH (1) TREE
2. REMOVAL OF A 9-20" DBH TREE SHALL BE REPLACED WITH (2) TREES
3. REMOVAL OF A 21"+ DBH TREE SHALL BE REPLACED WITH (3) TREES
4. TOTAL PROPOSED TREES TO REMOVE:

3-8"	=	11 TREES
9-20"	=	9 TREES
21"+	=	5 TREES
TOTAL	=	44 TREES



KEY PLAN





ACCESSIBLE TRAIL CONNECTION - ADD ALTERNATIVE
SCALE: 1" = 30'-0"

ARLINGTON RESERVOIR - PHASE 2
ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE

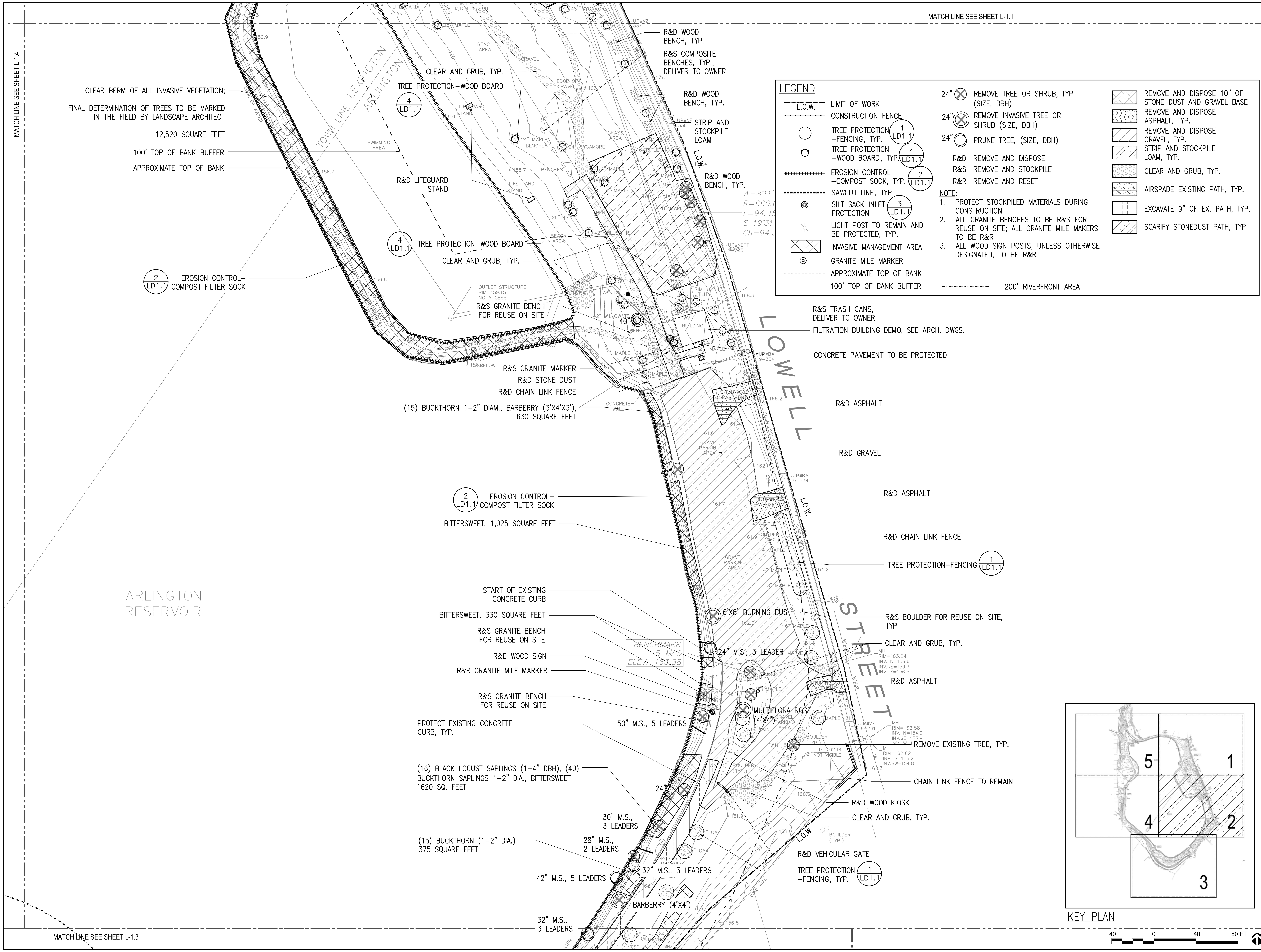
kzla
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202
Boston, MA 02108
617 451-1018 Tel
www.kylezick.com

100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB | Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: 1"=40'-0"
Drawing Title:

SITE PREPARATION AND DEMO PLAN

L1.1



LEGEND

L.O.W.	LIMIT OF WORK
	CONSTRUCTION FENCE
	TREE PROTECTION-FENCING, TYP. (1 LD1.1)
	TREE PROTECTION-WOOD BOARD, TYP. (4 LD1.1)
	EROSION CONTROL-COMPOST SOCK, TYP. (2 LD1.1)
	SAWCUT LINE, TYP.
	SILT SACK INLET PROTECTION (3 LD1.1)
	LIGHT POST TO REMAIN AND BE PROTECTED, TYP.
	INVASIVE MANAGEMENT AREA
	GRANITE MILE MARKER
	APPROXIMATE TOP OF BANK
	100' TOP OF BANK BUFFER
	200' RIVERFRONT AREA
24"	REMOVE TREE OR SHRUB, TYP. (SIZE, DBH)
24"	REMOVE INVASIVE TREE OR SHRUB (SIZE, DBH)
24"	PRUNE TREE, (SIZE, DBH)
R&D	REMOVE AND DISPOSE
R&S	REMOVE AND STOCKPILE
R&R	REMOVE AND RESET
	REMOVE AND DISPOSE 10" OF STONE DUST AND GRAVEL BASE
	REMOVE AND DISPOSE ASPHALT, TYP.
	REMOVE AND DISPOSE GRAVEL, TYP.
	STRIP AND STOCKPILE LOAM, TYP.
	CLEAR AND GRUB, TYP.
	AIRSPADE EXISTING PATH, TYP.
	EXCAVATE 9" OF EX. PATH, TYP.
	SCARIFY STONEDUST PATH, TYP.

NOTE:
1. PROTECT STOCKPILED MATERIALS DURING CONSTRUCTION
2. ALL GRANITE BENCHES TO BE R&S FOR REUSE ON SITE; ALL GRANITE MILE MAKERS TO BE R&R
3. ALL WOOD SIGN POSTS, UNLESS OTHERWISE DESIGNATED, TO BE R&R

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

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100% DESIGN DEVELOPMENT SET

Job Number:
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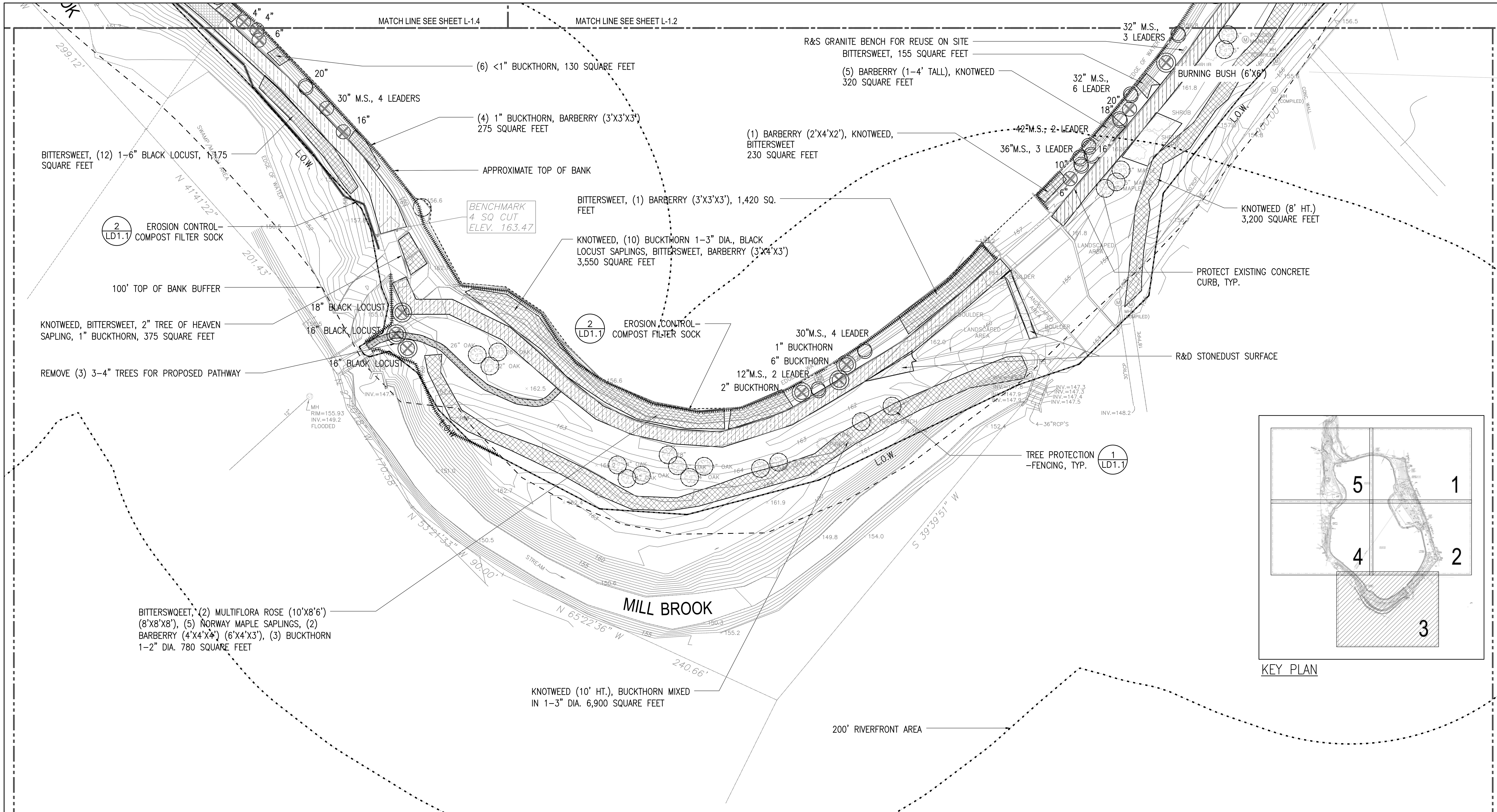
Date: NOVEMBER 13, 2020
Scale: 1"=40'-0"
Drawing Title:

SITE PREPARATION AND DEMO PLAN

L1.2



LEGEND

Symbol	Description
L.O.W.	LIMIT OF WORK
	CONSTRUCTION FENCE
	TREE PROTECTION -FENCING, TYP. (1 / LD1.1)
	TREE PROTECTION -WOOD BOARD, TYP. (4 / LD1.1)
	EROSION CONTROL -COMPOST SOCK, TYP. (2 / LD1.1)
	SAWCUT LINE, TYP.
	SILT SACK INLET PROTECTION (3 / LD1.1)
	LIGHT POST TO REMAIN AND BE PROTECTED, TYP.
	INVASIVE MANAGEMENT AREA
	GRANITE MILE MARKER
	APPROXIMATE TOP OF BANK
	100' TOP OF BANK BUFFER
24"	REMOVE TREE OR SHRUB, TYP. (SIZE, DBH)
24"	REMOVE INVASIVE TREE OR SHRUB (SIZE, DBH)
24"	PRUNE TREE, (SIZE, DBH)
R&D	REMOVE AND DISPOSE
R&S	REMOVE AND STOCKPILE
R&R	REMOVE AND RESET
	200' RIVERFRONT AREA
	REMOVE AND DISPOSE 10" OF STONE DUST AND GRAVEL BASE
	REMOVE AND DISPOSE ASPHALT, TYP.
	REMOVE AND DISPOSE GRAVEL, TYP.
	STRIP AND STOCKPILE LOAM, TYP.
	CLEAR AND GRUB, TYP.
	AIRSPADE EXISTING PATH, TYP.
	EXCAVATE 9" OF EX. PATH, TYP.
	SCARIFY STONEDUST PATH, TYP.

NOTE:
1. PROTECT STOCKPILED MATERIALS DURING CONSTRUCTION
2. ALL GRANITE BENCHES TO BE R&S FOR REUSE ON SITE; ALL GRANITE MILE MAKERS TO BE R&R
3. ALL WOOD SIGN POSTS, UNLESS OTHERWISE DESIGNATED, TO BE R&R

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

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kzla
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36 Bromfield Street Suite 202 Boston, MA 02108
617 451-1018 Tel
www.kylezick.com

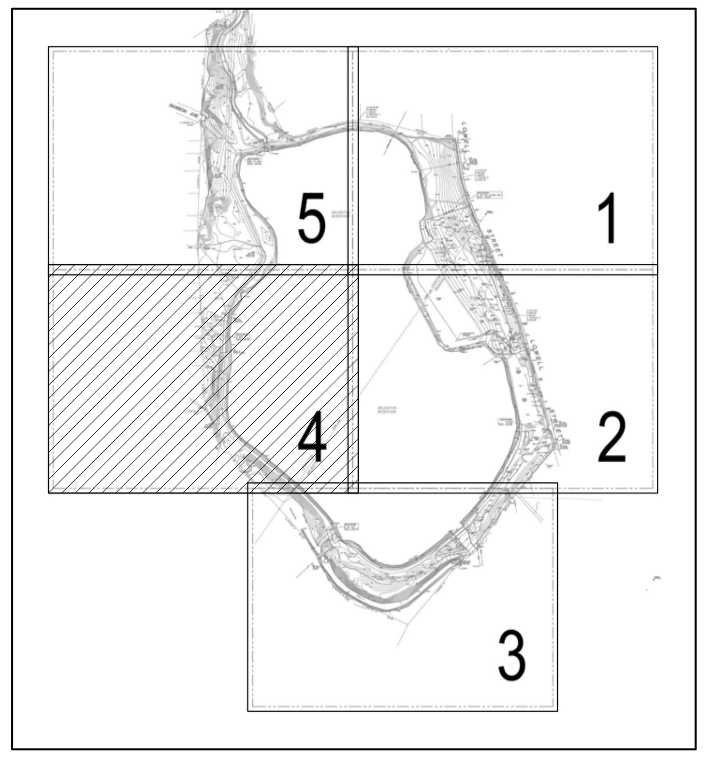
MASSACHUSETTS KYLE S. ZICK REGISTERED LANDSCAPE ARCHITECT

100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB
Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: 1"=40'-0"
Drawing Title:

SITE PREPARATION AND DEMO PLAN

L1.3



KEY PLAN

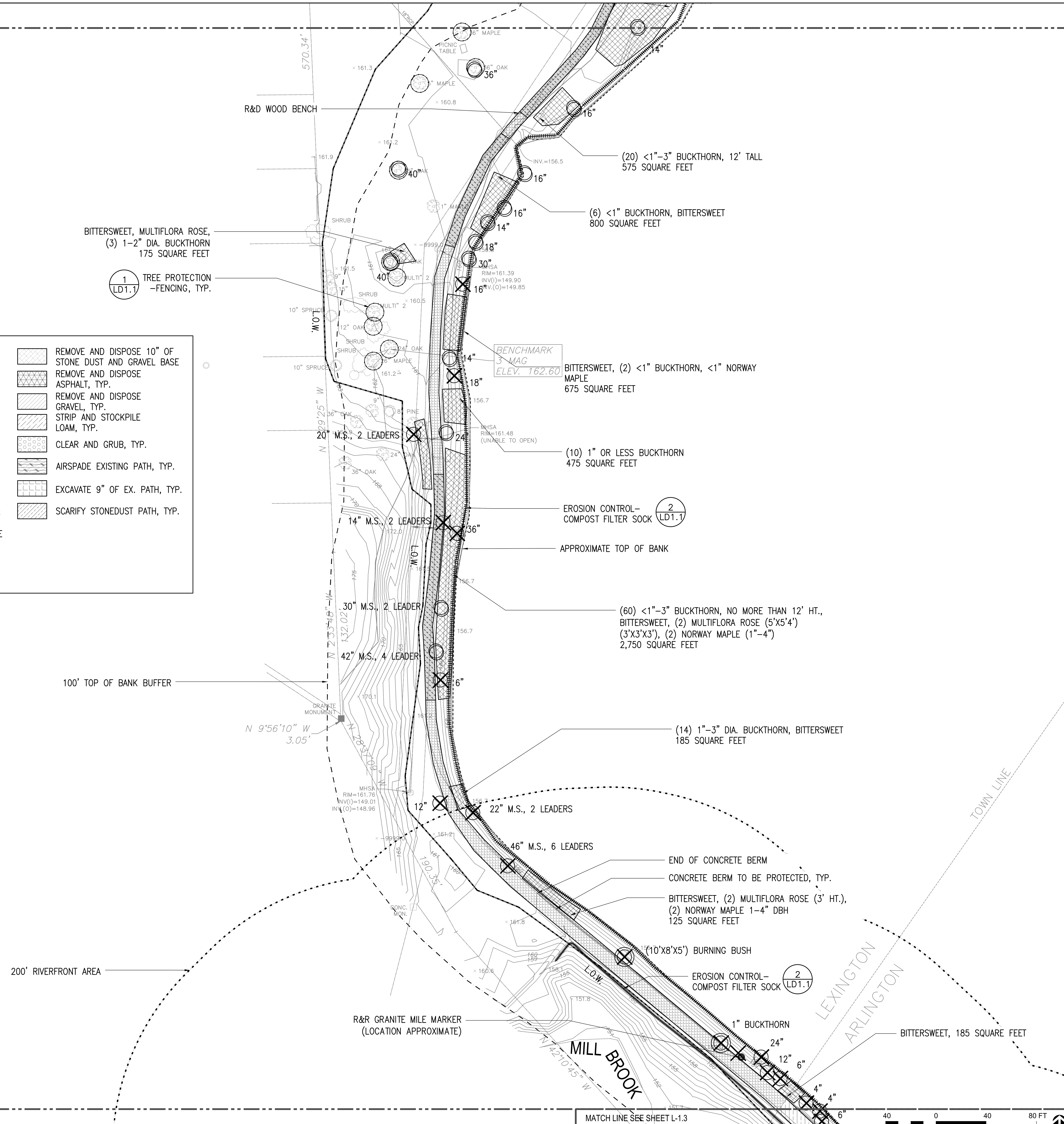
LEGEND

L.O.W.	LIMIT OF WORK
	CONSTRUCTION FENCE
	TREE PROTECTION -FENCING, TYP. 1/LD1.1
	TREE PROTECTION -WOOD BOARD, TYP. 4/LD1.1
	EROSION CONTROL -COMPOST SOCK, TYP. 2/LD1.1
	SAWCUT LINE, TYP.
	SILT SACK INLET PROTECTION 3/LD1.1
	LIGHT POST TO REMAIN AND BE PROTECTED, TYP.
	INVASIVE MANAGEMENT AREA
	GRANITE MILE MARKER
	APPROXIMATE TOP OF BANK
	100' TOP OF BANK BUFFER

24"	REMOVE TREE OR SHRUB, TYP. (SIZE, DBH)
24"	REMOVE INVASIVE TREE OR SHRUB (SIZE, DBH)
24"	PRUNE TREE, (SIZE, DBH)
R&D	REMOVE AND DISPOSE
R&S	REMOVE AND STOCKPILE
R&R	REMOVE AND RESET
	200' RIVERFRONT AREA

NOTE:
1. PROTECT STOCKPILED MATERIALS DURING CONSTRUCTION
2. ALL GRANITE BENCHES TO BE R&S FOR REUSE ON SITE; ALL GRANITE MILE MAKERS TO BE R&R
3. ALL WOOD SIGN POSTS, UNLESS OTHERWISE DESIGNATED, TO BE R&R

	REMOVE AND DISPOSE 10" OF STONE DUST AND GRAVEL BASE
	REMOVE AND DISPOSE ASPHALT, TYP.
	REMOVE AND DISPOSE GRAVEL, TYP.
	STRIP AND STOCKPILE LOAM, TYP.
	CLEAR AND GRUB, TYP.
	AIRSPADE EXISTING PATH, TYP.
	EXCAVATE 9" OF EX. PATH, TYP.
	SCARIFY STONEDUST PATH, TYP.



ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

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36 Bromfield Street Suite 202
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100% DESIGN DEVELOPMENT SET

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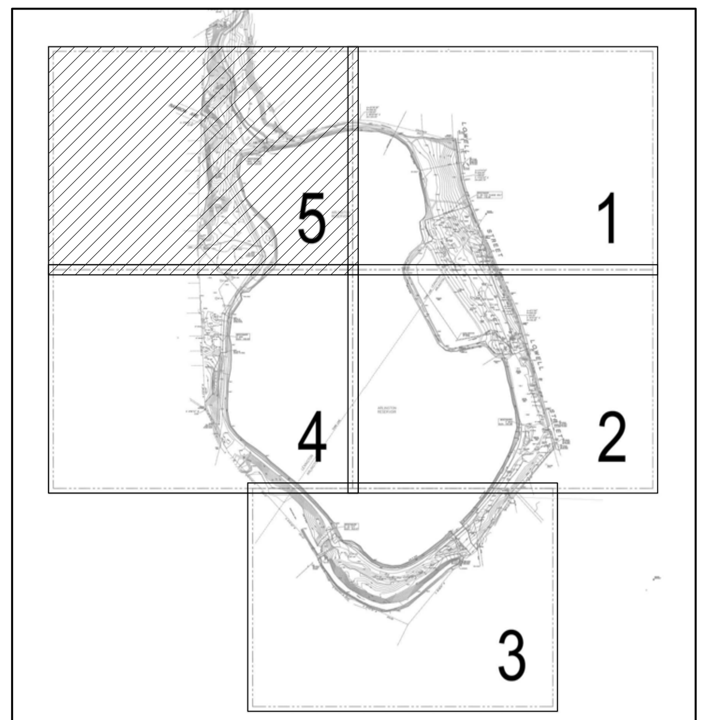
Project: ARLINGTON RES.	
Drawn By: JL/MD/RB	Checked By: KZ
Date: NOVEMBER 13, 2020	
Scale: 1"=40'-0"	
Drawing Title:	

SITE PREPARATION AND DEMO PLAN

L1.4

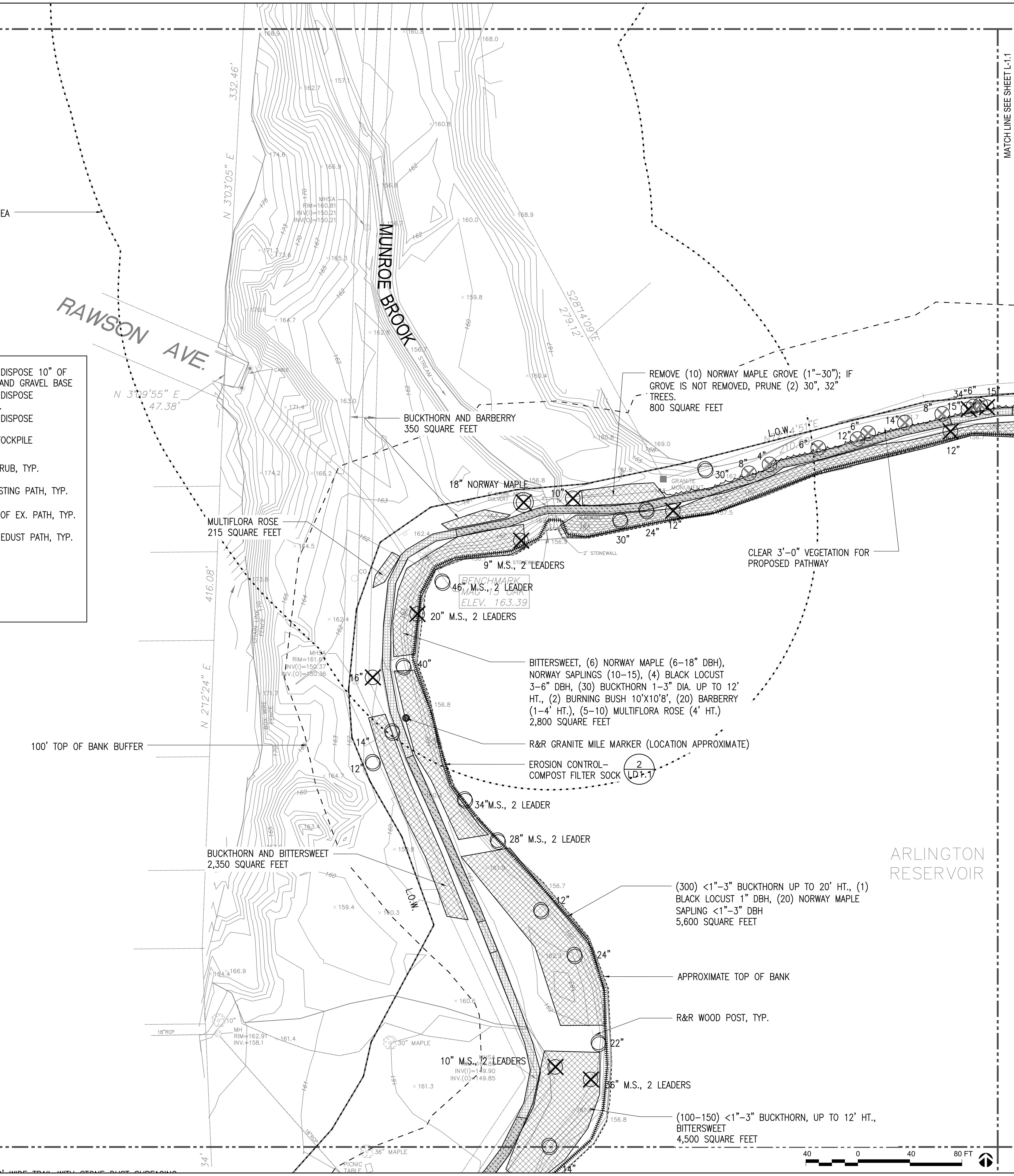


KEY PLAN

LEGEND

L.O.W.	LIMIT OF WORK
	CONSTRUCTION FENCE
	TREE PROTECTION -FENCING, TYP. (1/LD1.1)
	TREE PROTECTION -WOOD BOARD, TYP. (4/LD1.1)
	EROSION CONTROL -COMPOST SOCK, TYP. (2/LD1.1)
	SAWCUT LINE, TYP.
	SILT SACK INLET PROTECTION (3/LD1.1)
	LIGHT POST TO REMAIN AND BE PROTECTED, TYP.
	INVASIVE MANAGEMENT AREA
	GRANITE MILE MARKER
	APPROXIMATE TOP OF BANK
	100' TOP OF BANK BUFFER
24"	REMOVE TREE OR SHRUB, TYP. (SIZE, DBH)
24"	REMOVE INVASIVE TREE OR SHRUB (SIZE, DBH)
24"	PRUNE TREE, (SIZE, DBH)
R&D	REMOVE AND DISPOSE
R&S	REMOVE AND STOCKPILE
R&R	REMOVE AND RESET
	200' RIVERFRONT AREA
	REMOVE AND DISPOSE 10" OF STONE DUST AND GRAVEL BASE
	REMOVE AND DISPOSE ASPHALT, TYP.
	REMOVE AND DISPOSE GRAVEL, TYP.
	STRIP AND STOCKPILE LOAM, TYP.
	CLEAR AND GRUB, TYP.
	AIRSPADE EXISTING PATH, TYP.
	EXCAVATE 9" OF EX. PATH, TYP.
	SCARIFY STONEDUST PATH, TYP.

NOTE:
1. PROTECT STOCKPILED MATERIALS DURING CONSTRUCTION
2. ALL GRANITE BENCHES TO BE R&S FOR REUSE ON SITE; ALL GRANITE MILE MAKERS TO BE R&R
3. ALL WOOD SIGN POSTS, UNLESS OTHERWISE DESIGNATED, TO BE R&R



ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE

kzla
Kyle Zick Landscape Architecture, Inc.
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617 451-1018 Tel
www.kylezick.com

COMMONWEALTH OF MASSACHUSETTS - KYLE S. ZICK - REGISTERED LANDSCAPE ARCHITECT

100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB | Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: 1"=40'-0"
Drawing Title:

SITE PREPARATION AND DEMO PLAN

L1.5

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

LEGEND

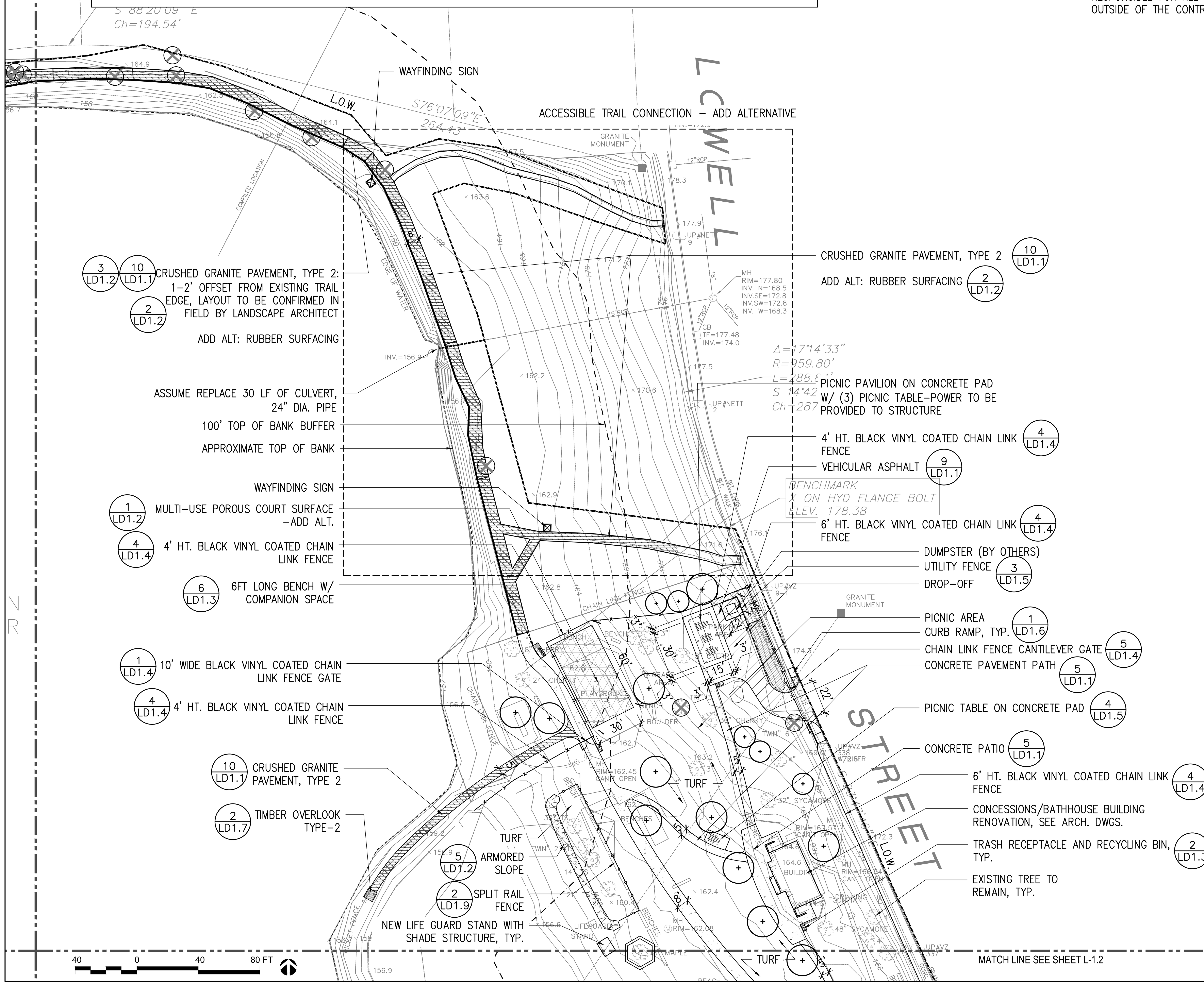
L.O.W.	LIMIT OF WORK
	RESTORED EXISTING STONEDUST TRAIL
	CRUSHED GRANITE PAVEMENT, TYPE 1 (NON-STABILIZED)
	CRUSHED GRANITE PAVEMENT, TYPE 2 (STABILIZED)
	PEDESTRIAN ASPHALT
	VEHICULAR ASPHALT
	WOOD FIBER SURFACING
	POURED-IN-PLACE RUBBER SURFACING
	CONCRETE PAVEMENT
	PERMEABLE CONCRETE UNIT PAVER
	MULTI-USE COURT SURFACE
	POROUS PAVEMENT
	PICNIC TABLE
	SPLIT RAIL FENCE
	BLACK VINYL COATED CHAIN LINK FENCE
	BLACK VINYL COATED CHAIN LINK FENCE GATE
	TRASH RECEPTACLE AND RECYCLING BIN
	BIKE RACK
	6FT LONG BENCH W/ COMPANION SPACE
	CHAIN LINK FENCE CANTILEVER GATE
	WOODEN GATE W/ GRANITE POST
	PLACED BOULDER
	WAYFINDING SIGN
	RESET GRANITE MILE MARKER
	TIMBER OVERLOOKS -TYPES 1 & 2
	ARMORED SLOPE
	TABLE AND CHAIRS
	NEW LIFE GUARD STAND WITH SHADE STRUCTURE
	HEXAGONAL BENCH
	APPROXIMATE TOP OF BANK
	100' TOP OF BANK BUFFER
	200' RIVERFRONT AREA

NOTE:
1. PERIMETER TRAIL BENCH LOCATIONS SHALL BE FIELD VERIFIED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION

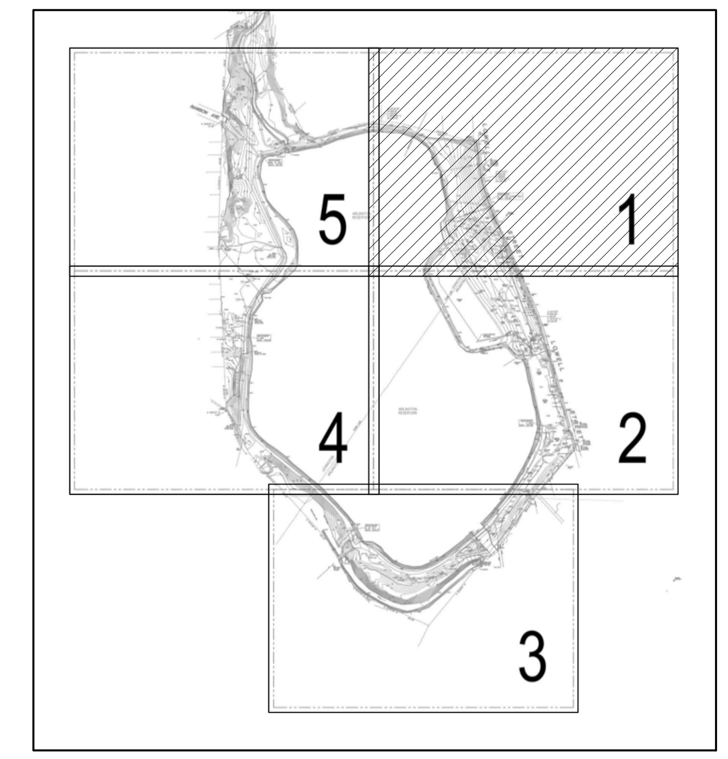
LAYOUT NOTES:

1. ALL LINE AND GRADE WORK PER DRAWINGS AND SPECIFICATIONS SHALL BE LAID OUT BY A REGISTERED CIVIL ENGINEER OR SURVEYOR ENGAGED BY THE CONTRACTOR.
2. ALL LINES AND DIMENSIONS ARE PARALLEL OR PERPENDICULAR TO THE LINES FROM WHICH THEY ARE MEASURED UNLESS OTHERWISE INDICATED.
3. STORAGE AREAS FOR CONTRACTOR'S EQUIPMENT AND MATERIALS SHALL BE IN AND WITHIN THE MATERIALS AND STORAGE AREA AS SHOWN ON PLANS AND AS APPROVED BY THE LANDSCAPE ARCHITECT.
4. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES IN THE SITE SURVEY TO THE LANDSCAPE ARCHITECT PRIOR TO STARTING WORK.
5. ALL LAYOUTS FOR WALKS AND PATHS SHALL BE ADEQUATELY STAKED BY THE CONTRACTOR AND APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO CONSTRUCTION.
6. THE CONTRACTOR SHALL ESTABLISH PERMANENT CONSTRUCTION BENCH MARKS. MAINTAIN ALL ESTABLISHED BOUNDS AND BENCH MARKS AND REPLACE AS DIRECTED ANY WHICH ARE DESTROYED OR DISTURBED.
7. CONTRACTOR SHALL COORDINATE LOCATION OF ALL UTILITIES (LINES, DUCTS, CONDUITS, SLEEVES, FOOTINGS, ETC.) WITH LOCATIONS OF PROPOSED LANDSCAPE ELEMENTS (WALLS, FENCE, FOOTINGS, TREE ROOTBALLS, PROPOSED LIGHTING FOOTINGS, ETC.). CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO LANDSCAPE ARCHITECT PRIOR TO CONTINUING WORK.
8. LIMIT OF WORK LINE IS NOTED ON DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE DUE TO OPERATIONS INSIDE AND OUTSIDE OF THE CONTRACT LIMIT LINE. ANY AREA OUTSIDE THE LIMIT OF WORK THAT ARE DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
9. PROVIDE EXPANSION JOINTS AT ALL CURBS, WALLS, STEPS, LIGHT POLE BASES, PULL BOXES, MANHOLES, ETC. AND AS SHOWN ON PLAN.
10. LOAM AND SEED ALL DISTURBED AREAS THAT ARE NOT PROPOSED AS PAVEMENT UNLESS OTHERWISE INDICATED ON PLANS.
11. WITHIN THE LIMIT OF WORK, CONTRACTOR SHALL IDENTIFY ALL TREE LIMBS LOWER THAN 10' ABOVE THE GROUND SURFACE THAT MAY BE VULNERABLE TO EQUIPMENT DAMAGE. NOTIFY THE LANDSCAPE ARCHITECT PRIOR TO STARTING WORK BENEATH ANY OF THESE LIMBS. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO TREE LIMBS DUE TO CONTRACTOR OPERATIONS.
12. ALL SITE AMENITIES PAVEMENT MARKINGS AND SIGNS TO BE FIELD LOCATED AND APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

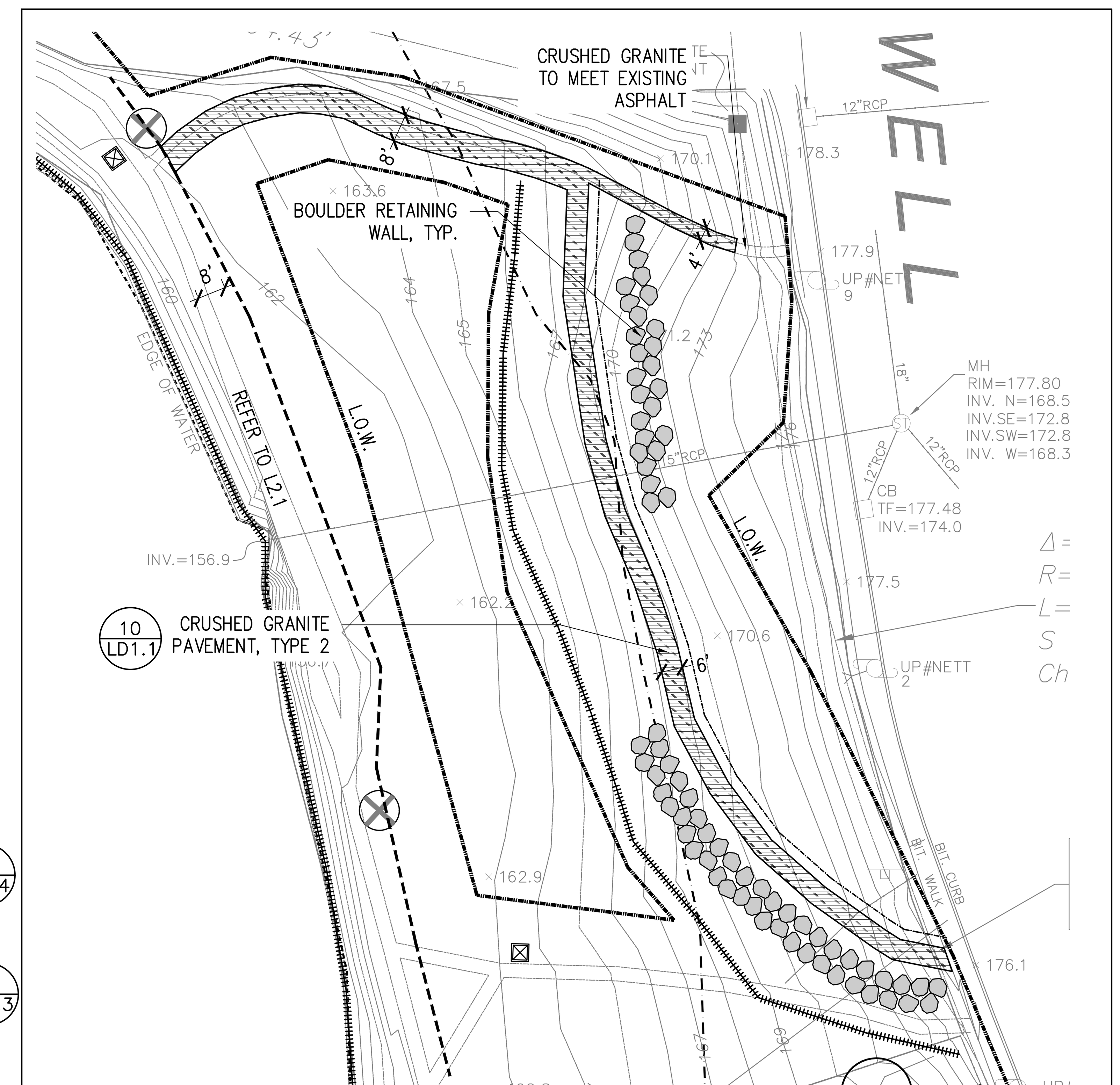
MATCH LINE SEE SHEET L-2.5



MATCH LINE SEE SHEET L-1.2



KEY PLAN



ACCESSIBLE TRAIL CONNECTION – ADD ALTERNATIVE
SCALE: 1" = 30'-0"

NO.	REVISION	DATE

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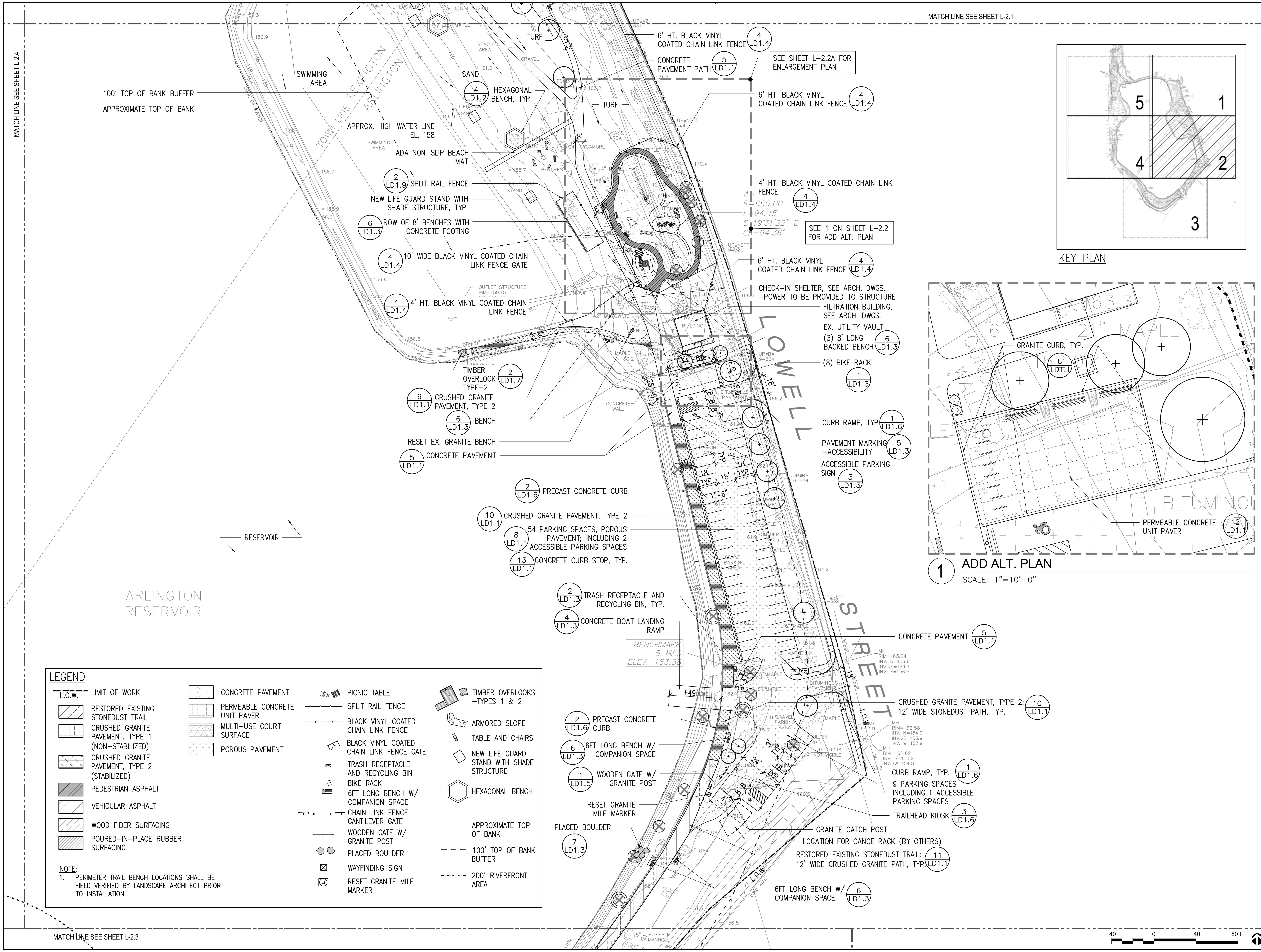
100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB | Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: 1"=40'-0"
Drawing Title:

LAYOUT AND MATERIAL PLAN

L2.1



ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

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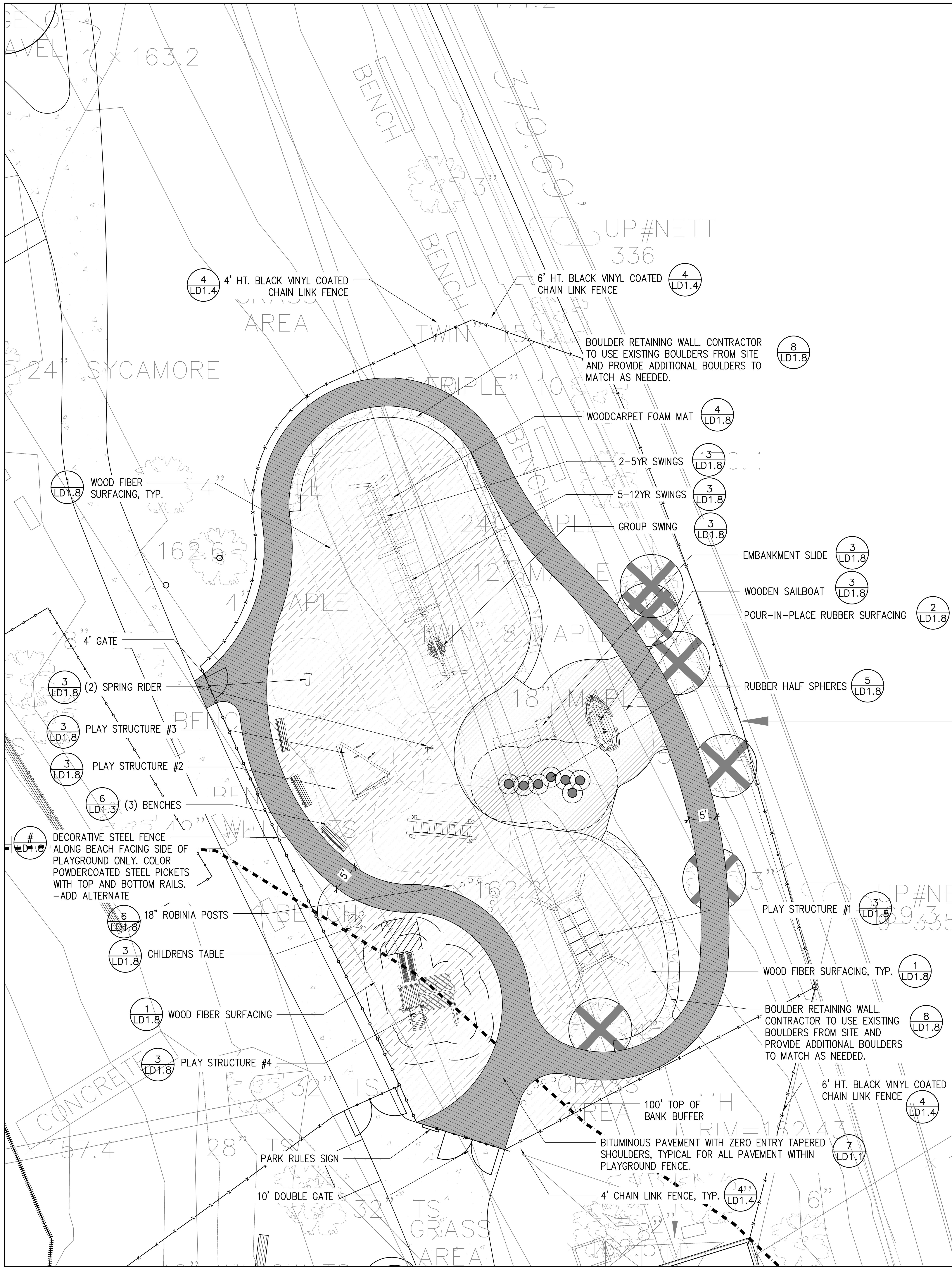
Drawing Title:

LAYOUT AND MATERIAL PLAN

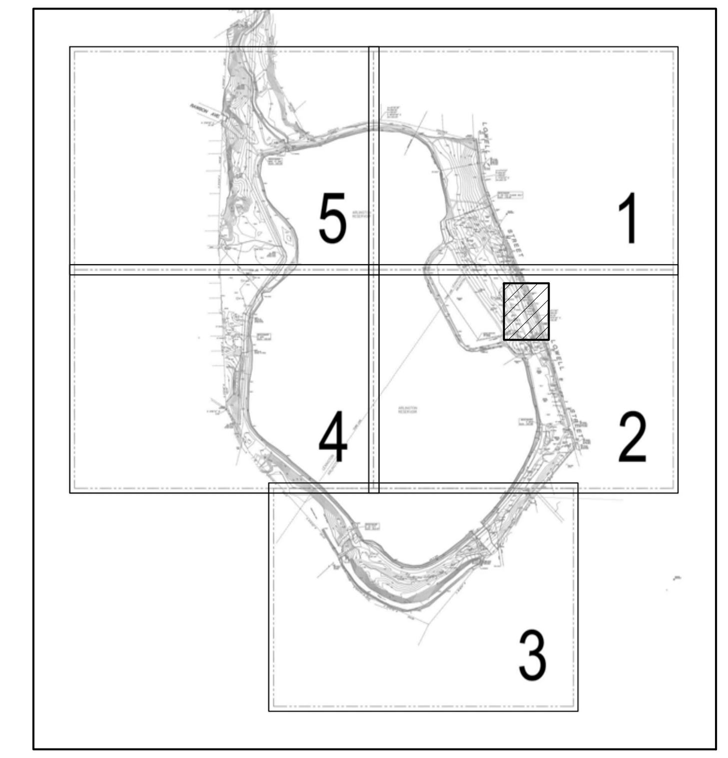
L2.2



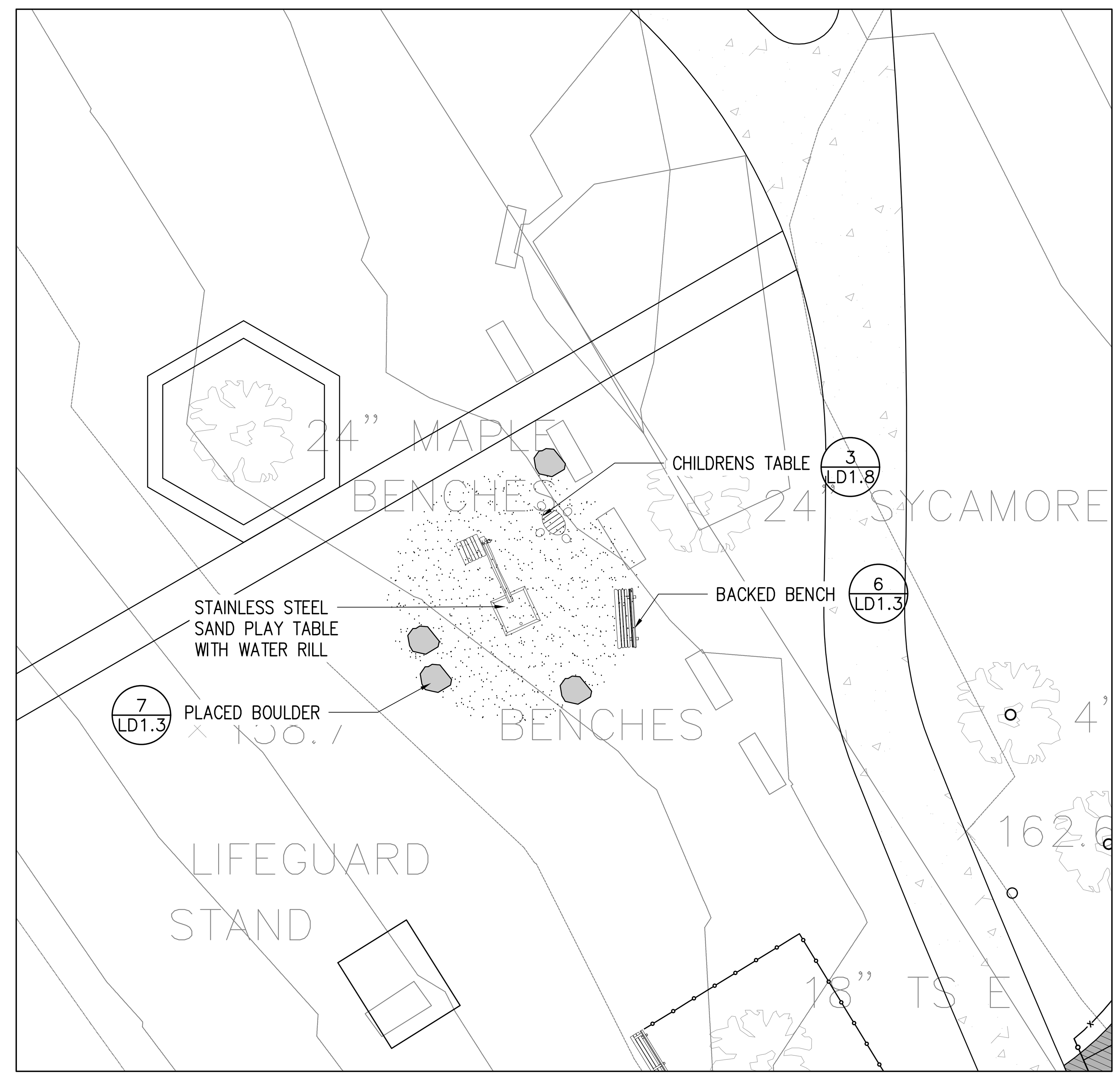
LEGEND

L.O.W.	LIMIT OF WORK		PICNIC TABLE
	PEDESTRIAN ASPHALT		BLACK VINYL COATED CHAIN LINK FENCE
	WOOD FIBER SURFACING		BLACK VINYL COATED CHAIN LINK FENCE GATE
	POUR-IN-PLACE RUBBER SURFACING		THERMOPLASTIC PAVEMENT GRAPHICS
	SET BOULDERS. VOIDS LARGER THAN 6" TO BE FIELD WITH SMALLER STONES TO MATCH AND MORTARED		PLACED BOULDER
	CONCRETE PAVEMENT		

NOTE:
1. PERIMETER TRAIL BENCH LOCATIONS SHALL BE FIELD VERIFIED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION



KEY PLAN



ENLARGEMENT - SAND AND WATER PLAY

10 0 10 20 FT

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

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100% DESIGN DEVELOPMENT SET

Job Number:
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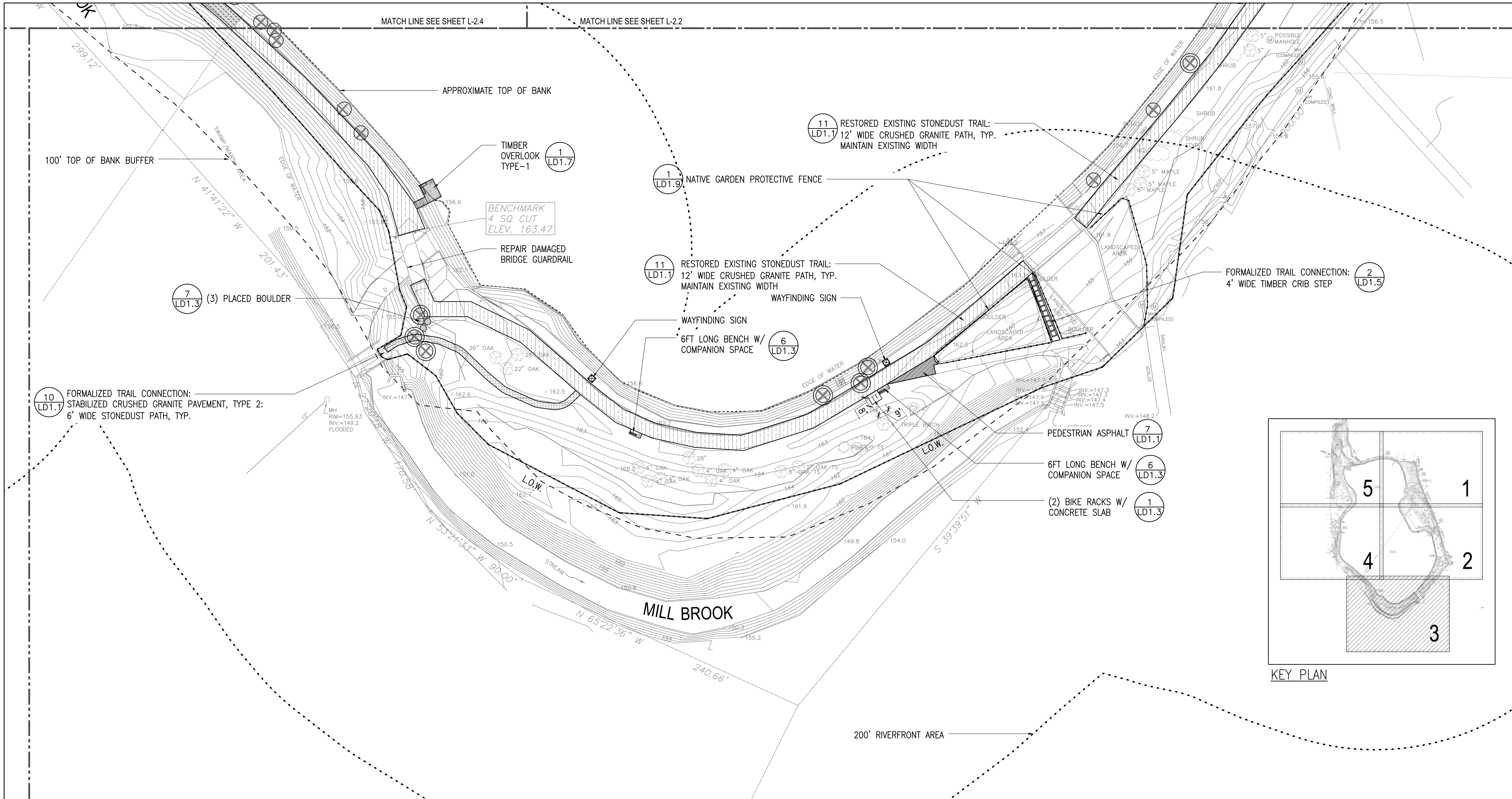
Drawn By: JL/MD/RB Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: 1"=10'-0"
Drawing Title:

ENLARGED LAYOUT AND MATERIAL PLAN

L2.2A



LEGEND

- L.O.W. — LIMIT OF WORK
- RESTORED EXISTING STONEDUST TRAIL
- CRUSHED GRANITE PAVEMENT, TYPE 1 (NON-STABILIZED)
- CRUSHED GRANITE PAVEMENT, TYPE 2 (STABILIZED)
- PEDESTRIAN ASPHALT
- VEHICULAR ASPHALT
- WOOD FIBER SURFACING
- POURED-IN-PLACE RUBBER SURFACING
- CONCRETE PAVEMENT
- PERMEABLE CONCRETE UNIT PAVER
- MULTI-USE COURT SURFACE
- POROUS PAVEMENT
- PICNIC TABLE
- SPLIT RAIL FENCE
- BLACK VINYL COATED CHAIN LINK FENCE
- BLACK VINYL COATED CHAIN LINK FENCE GATE
- TRASH RECEPTACLE AND RECYCLING BIN
- BIKE RACK
- 6FT LONG BENCH W/ COMPANION SPACE
- CHAIN LINK FENCE CANTILEVER GATE
- WOODEN GATE W/ GRANITE POST
- PLACED BOULDER
- WAYFINDING SIGN
- RESET GRANITE MILE MARKER
- TIMBER OVERLOOKS -TYPES 1 & 2
- ARMORED SLOPE
- TABLE AND CHAIRS
- NEW LIFE GUARD STAND WITH SHADE STRUCTURE
- HEXAGONAL BENCH
- APPROXIMATE TOP OF BANK
- 100' TOP OF BANK BUFFER
- 200' RIVERFRONT AREA

NOTE:
1. PERIMETER TRAIL BENCH LOCATIONS SHALL BE FIELD VERIFIED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE

kzla
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202
Boston, MA 02108
617 451-1018 Tel
www.kylezick.com

MASSACHUSETTS KYLE S. ZICK REGISTERED LANDSCAPE ARCHITECT

100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB | Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: 1"=40'-0"
Drawing Title:

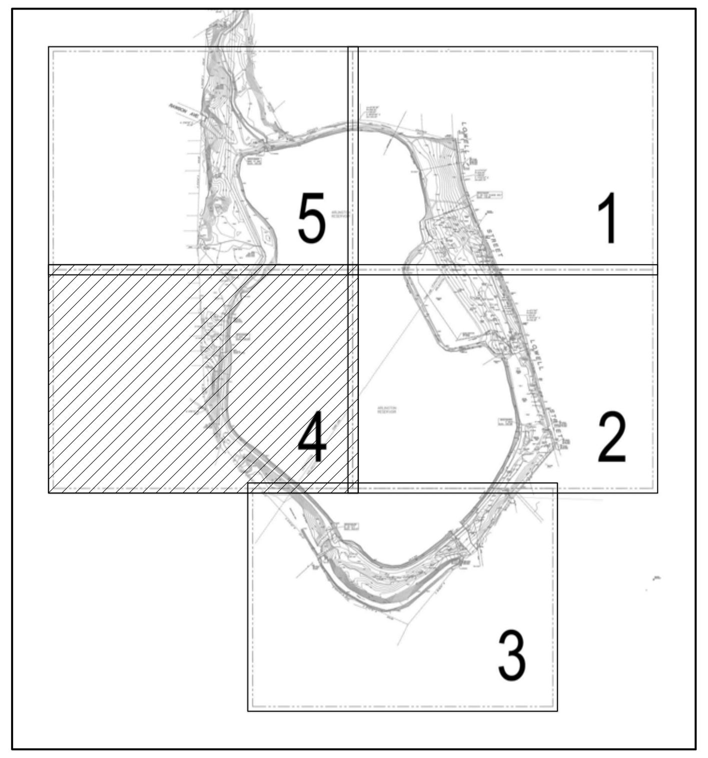
LAYOUT AND MATERIAL PLAN

L2.3

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

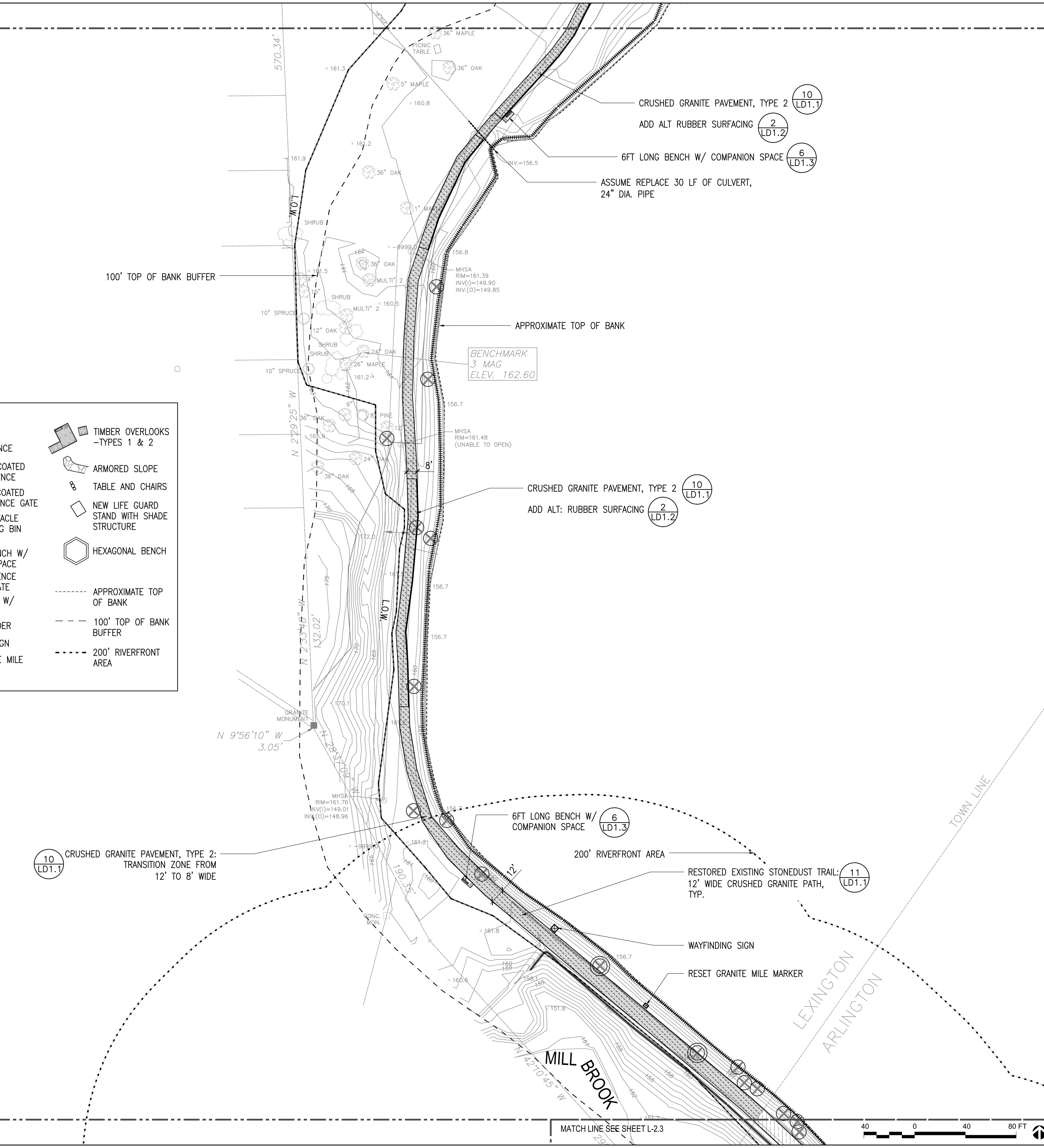


KEY PLAN

LEGEND

- L.O.W. — LIMIT OF WORK
- RESTORED EXISTING STONEDUST TRAIL
- CRUSHED GRANITE PAVEMENT, TYPE 1 (NON-STABILIZED)
- CRUSHED GRANITE PAVEMENT, TYPE 2 (STABILIZED)
- PEDESTRIAN ASPHALT
- VEHICULAR ASPHALT
- WOOD FIBER SURFACING
- POURED-IN-PLACE RUBBER SURFACING
- CONCRETE PAVEMENT
- PERMEABLE CONCRETE UNIT PAVER
- MULTI-USE COURT SURFACE
- POROUS PAVEMENT
- PICNIC TABLE
- SPLIT RAIL FENCE
- BLACK VINYL COATED CHAIN LINK FENCE
- BLACK VINYL COATED CHAIN LINK FENCE GATE
- TRASH RECEPTACLE AND RECYCLING BIN
- BIKE RACK
- 6FT LONG BENCH W/ COMPANION SPACE
- CHAIN LINK FENCE CANTILEVER GATE
- WOODEN GATE W/ GRANITE POST
- PLACED BOULDER
- WAYFINDING SIGN
- RESET GRANITE MILE MARKER
- TIMBER OVERLOOKS -TYPES 1 & 2
- ARMORED SLOPE
- TABLE AND CHAIRS
- NEW LIFE GUARD STAND WITH SHADE STRUCTURE
- HEXAGONAL BENCH
- APPROXIMATE TOP OF BANK
- 100' TOP OF BANK BUFFER
- 200' RIVERFRONT AREA

NOTE:
1. PERIMETER TRAIL BENCH LOCATIONS SHALL BE FIELD VERIFIED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION



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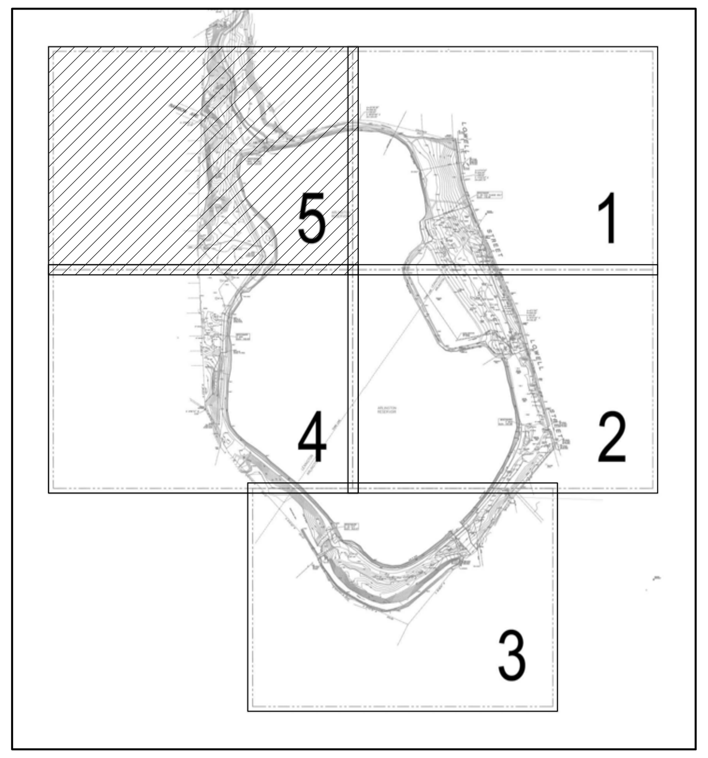
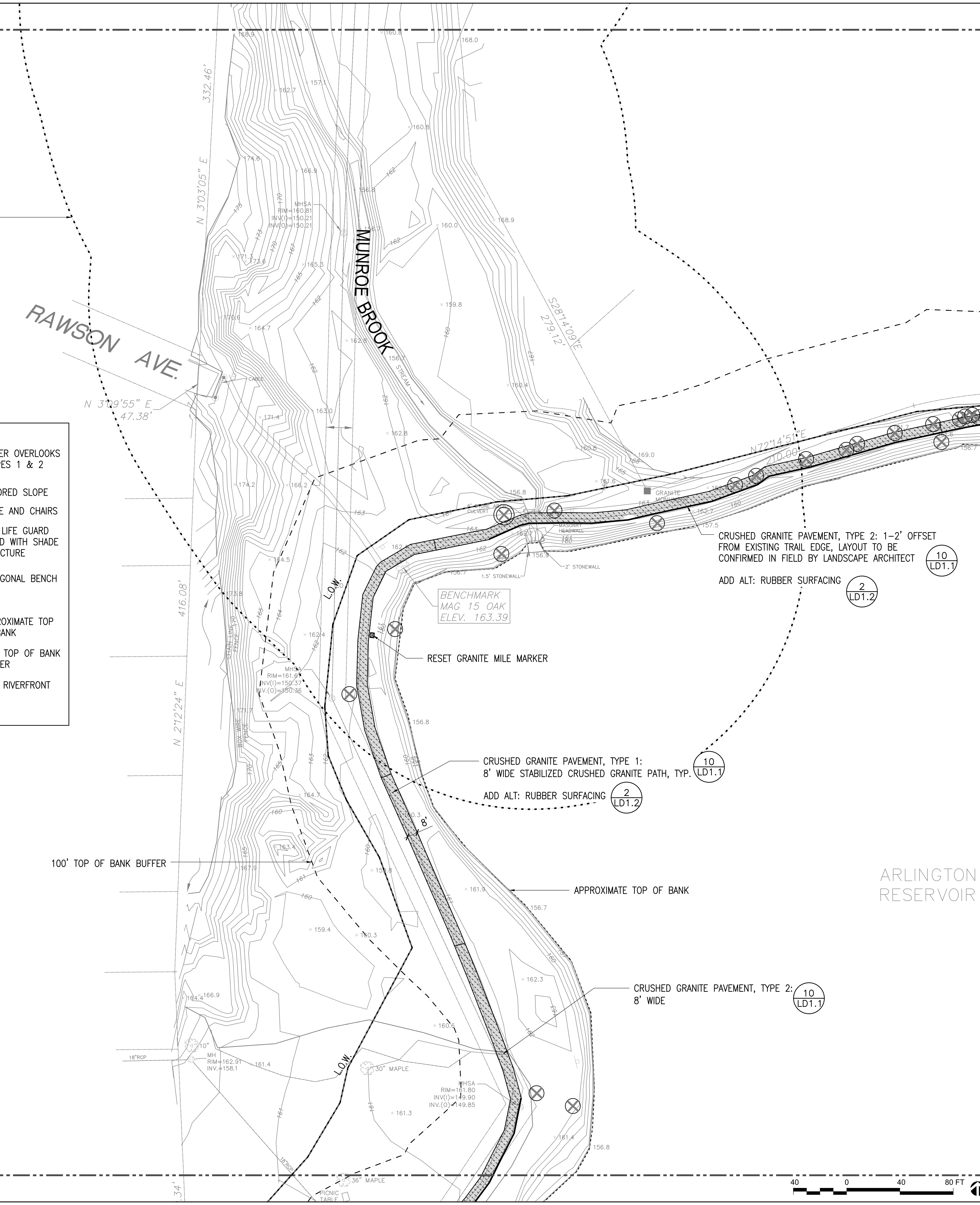
LAYOUT AND MATERIAL PLAN

L2.4



KEY PLAN



LEGEND

- L.O.W. — LIMIT OF WORK
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- CRUSHED GRANITE PAVEMENT, TYPE 2 (STABILIZED)
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- TABLE AND CHAIRS
- NEW LIFE GUARD STAND WITH SHADE STRUCTURE
- HEXAGONAL BENCH
- APPROXIMATE TOP OF BANK
- 100' TOP OF BANK BUFFER
- 200' RIVERFRONT AREA

NOTE:
1. PERIMETER TRAIL BENCH LOCATIONS SHALL BE FIELD VERIFIED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

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MASSACHUSETTS KYLE S. ZICK REGISTERED LANDSCAPE ARCHITECT

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Drawing Title:

LAYOUT AND MATERIAL PLAN

L2.5

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

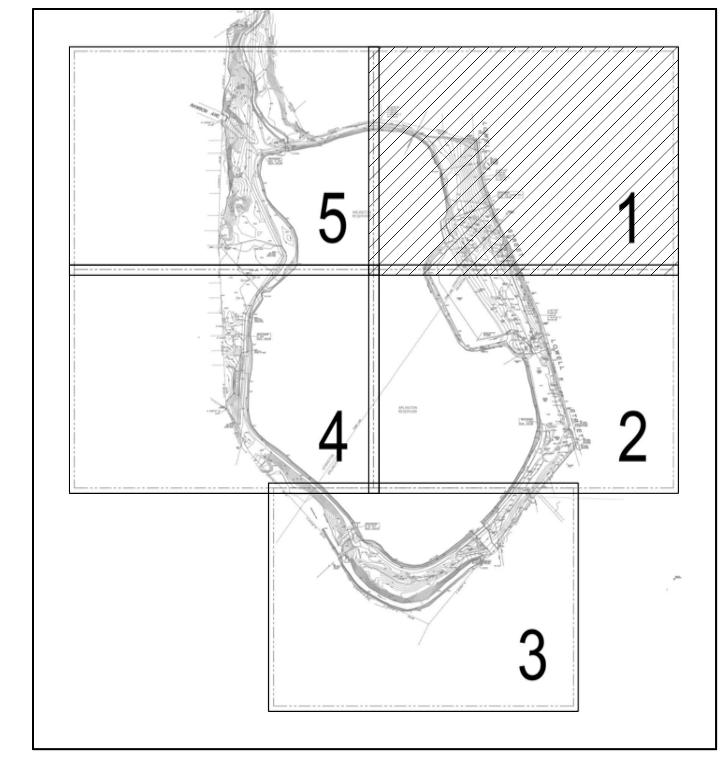
TOWN OF ARLINGTON

LEGEND

L.O.W.	LIMIT OF WORK	HP	HIGH POINT
138	PROPOSED CONTOUR, TYP.	LP	LOW POINT
138	EXISTING CONTOUR, TYP.	BC	BOTTOM OF CURB
+ 74.50	SPOT GRADE, TYP.	TC	TOP OF CURB
+ (74.50)	EXISTING SPOT GRADE, TYP.	BW	BOTTOM OF WALL
X%	SLOPE, TYP.	TW	TOP OF WALL
	APPROXIMATE TOP OF BANK	BOS	BOTTOM OF STAIR
	100' RESOURCE BUFFER	TOS	TOP OF STAIR
	200' RIVERFRONT AREA	RIM	CATCH BASIN RIM

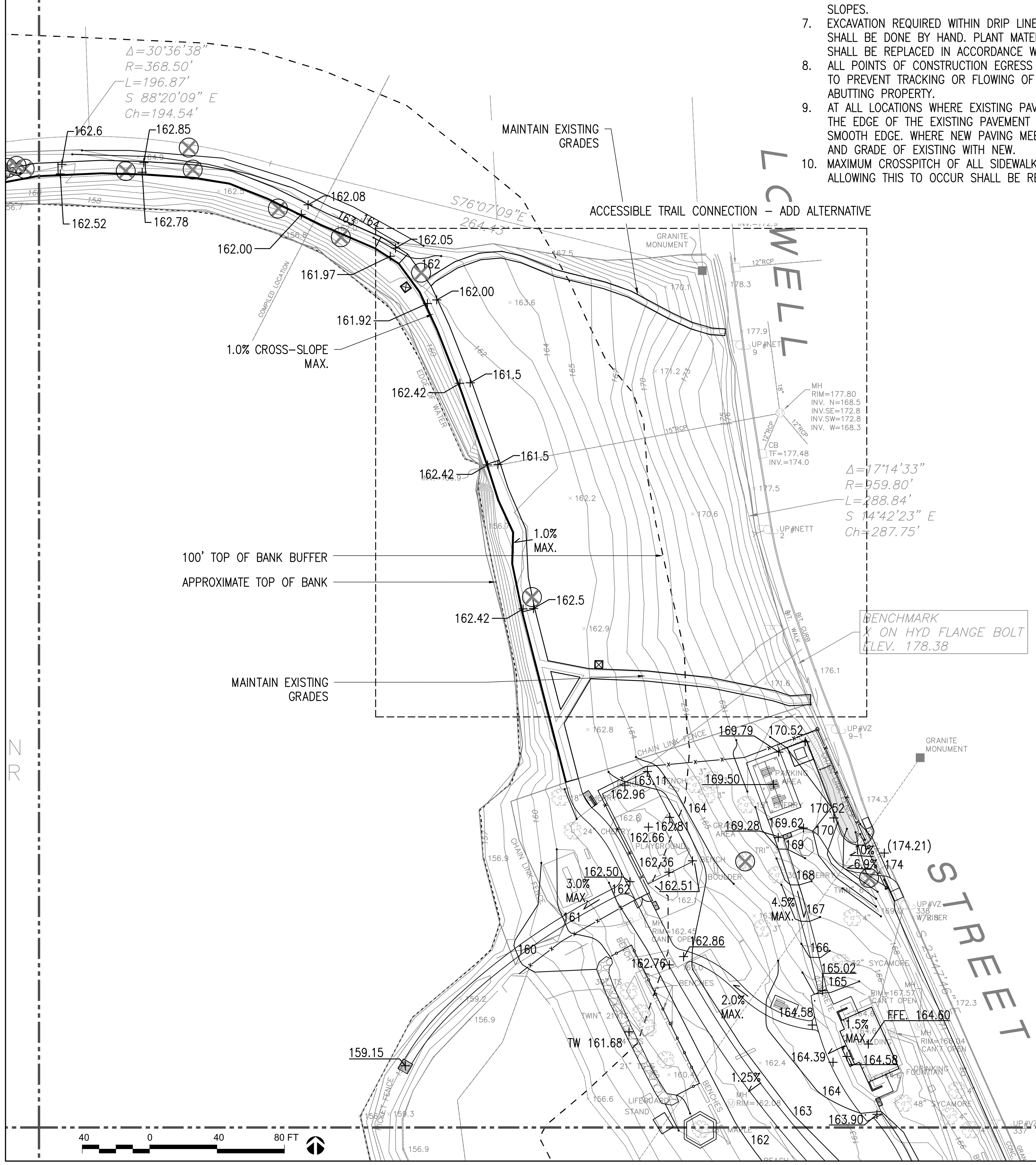
GRADING NOTES:

1. PRIOR TO COMMENCING ANY EXCAVATION WORK, THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES IN ACCORDANCE WITH THE "DIG SAFE" NOTIFICATION PROCEDURES PROMOTED BY RESPECTIVE UTILITY COMPANIES. THE 'DIG SAFE' TELEPHONE NUMBER FOR MASSACHUSETTS IS 811.
2. BOTTOM OF CURB ELEVATIONS BETWEEN EXISTING SPOT GRADES SHOWN ON SURVEY ARE INTERPOLATIONS. CONTRACTOR SHALL VERIFY ALL EXISTING GRADES IN THE FIELD AND SHALL REPORT ANY DISCREPANCIES BETWEEN EXISTING AND PROPOSED CONDITION TO THE LANDSCAPE ARCHITECT.
3. ANY AREA OUTSIDE THE LIMIT OF WORK THAT IS DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO COST TO THE OWNER.
4. COMPACT SUBGRADE PRIOR TO ANY FINISH GRADING. REMOVE ALL SOFT SPOTS OBSERVED OR IDENTIFIED IN FIELD.
5. PITCH EVENLY BETWEEN SPOT GRADES. ALL PAVED AREAS MUST PITCH TO DRAIN AT A MINIMUM SLOPE OF ONE-EIGHTH INCH (1/8") PER FOOT. ANY DISCREPANCIES NOT ALLOWING THIS TO OCCUR SHALL BE REPORTED TO THE LANDSCAPE ARCHITECT PRIOR TO CONTINUING WORK.
6. CONTRACTOR SHALL BLEND NEW EARTHWORK SMOOTHLY INTO EXISTING, PROVIDING VERTICAL CURVES OR ROUNDINGS AT ALL TOP AND BOTTOM OF SLOPES.
7. EXCAVATION REQUIRED WITHIN DRIP LINE OF TREES DESIGNATED TO REMAIN SHALL BE DONE BY HAND. PLANT MATERIALS DAMAGED BY CONTRACTOR SHALL BE REPLACED IN ACCORDANCE WITH THE SPECIFICATIONS.
8. ALL POINTS OF CONSTRUCTION EGRESS OR INGRESS SHALL BE MAINTAINED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADS OR ABUTTING PROPERTY.
9. AT ALL LOCATIONS WHERE EXISTING PAVEMENT ABUTS NEW CONSTRUCTION, THE EDGE OF THE EXISTING PAVEMENT SHALL BE SAW CUT TO A CLEAN, SMOOTH EDGE. WHERE NEW PAVING MEETS EXISTING PAVING, MEET LINE AND GRADE OF EXISTING WITH NEW.
10. MAXIMUM CROSSPITCH OF ALL SIDEWALKS IS 2%. ANY DISCREPANCIES NOT ALLOWING THIS TO OCCUR SHALL BE REPORTED TO THE LANDSCAPE ARCHITECT.
11. ALL GRADING SHALL COMPLY WITH THE RULES AND REGULATIONS OF THE OFFICIAL MANUAL OF THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD AND THE AMERICANS WITH DISABILITIES ACT STANDARDS FOR BUILDINGS AND FACILITIES, LATEST EDITION. IN CASE OF CONFLICT BETWEEN REGULATIONS, THE GUIDELINE PROVIDING GREATER ACCESS SHALL APPLY.
12. UTILITIES SHOWN ON THIS PLAN FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE LOCATION OF ALL UTILITIES (LINES, DUCTS, CONDUITS, SLEEVES, FOOTINGS, ETC.) WITH LOCATIONS OF PROPOSED LANDSCAPE ELEMENTS (WALLS, FENCE, FOOTINGS, TREE ROOTBALLS, PROPOSED LIGHTING FOOTINGS, ETC.). EXCAVATION REQUIRED WITHIN PROXIMITY OF UTILITY LINES SHALL BE DONE BY HAND. ANY DAMAGE AND INCURRED COSTS DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
13. CONTRACTOR SHALL MAINTAIN OR ADJUST TO PROPOSED FINISH GRADE AS NECESSARY ALL UTILITY AND SITE STRUCTURES SUCH AS LIGHT POLES, SIGN POSTS, MANHOLES, CATCH BASINS, HAND HOLES, WATER AND GAS GATES, HYDRANTS, ETC., FROM MAINTAINED UTILITY AND SITE SYSTEMS UNLESS OTHERWISE NOTED ON UTILITY DRAWINGS OR AS DIRECTED BY LANDSCAPE ARCHITECT.
14. CONTRACTOR SHALL PROVIDE FULL DEPTHS OF LOAM AS NOTED ON DETAILS AND AS SPECIFIED, FOR ALL PLANTING.
15. MAINTAIN THE INTEGRITY OF THE EXISTING DRAINAGE SYSTEM AT ALL TIMES, UNLESS OTHERWISE NOTED ON DRAWINGS.
16. LIMIT OF WORK LINE IS NOTED ON DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE DUE TO OPERATIONS INSIDE AND OUTSIDE OF THE CONTRACT LIMIT LINE. ANY AREAS OUTSIDE THE LIMIT OF WORK THAT ARE DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER. CONTRACTOR SHALL MEET LINE AND GRADE OF EXISTING CONDITIONS AT LIMIT OF WORK LINE.
17. EROSION CONTROL BLANKETS SHALL BE USED ON NEWLY GRADED SLOPES THAT ARE EQUAL TO OR STEEPER THAN A 3:1 SLOPE.
18. DUE TO TIGHT GRADING REQUIREMENTS FOR PAVED SURFACES, CONTRACTOR SHALL REVIEW GRADING WITH LANDSCAPE ARCHITECT AT THE COMPLETION OF ROUGH GRADING AND AT THE COMPLETION OF BINDER COURSE FOR EACH PHASE.

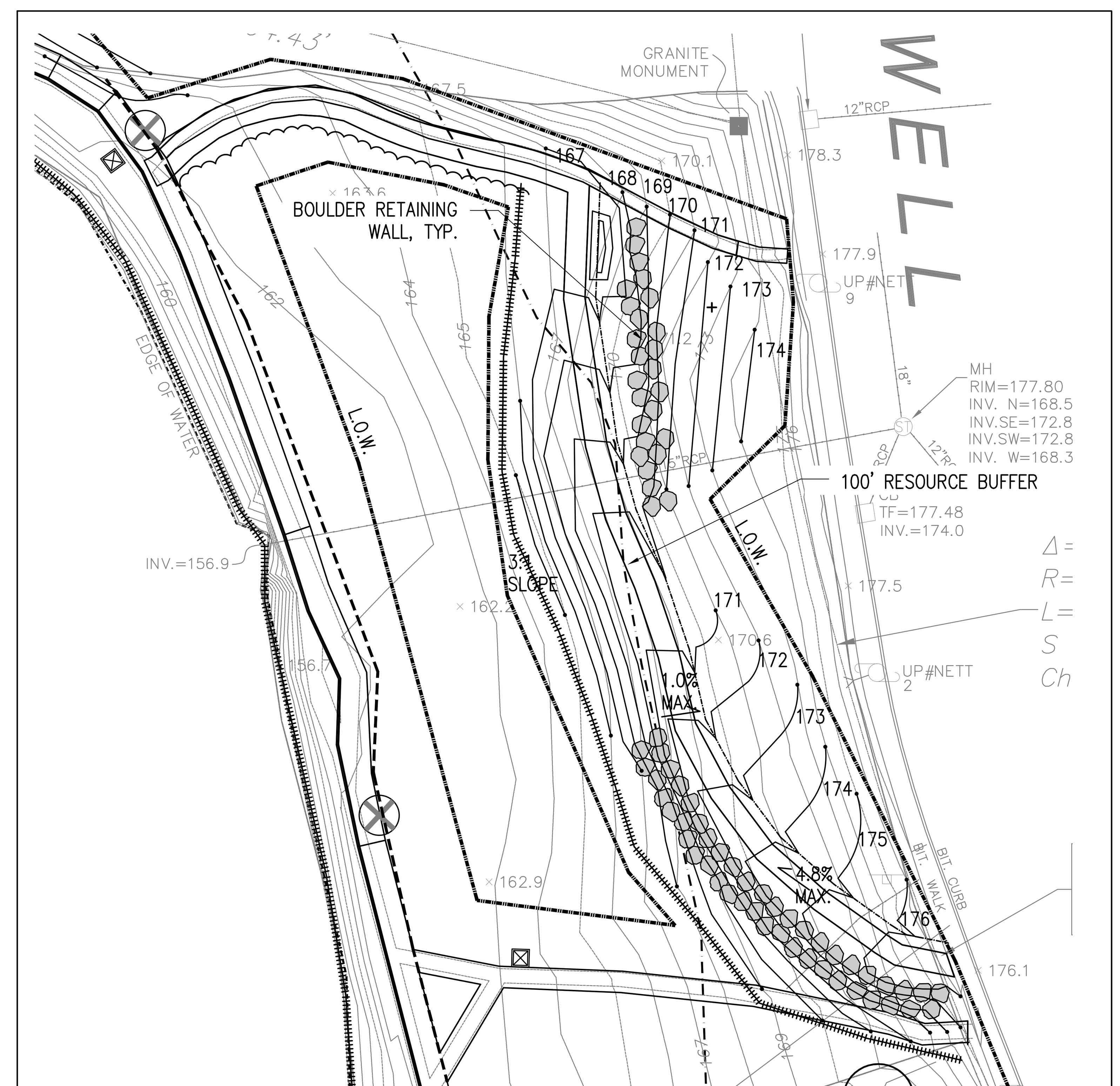


KEY PLAN

MATCH LINE SEE SHEET L-3.5



MATCH LINE SEE SHEET L-1.2



ACCESSIBLE TRAIL CONNECTION - ADD ALTERNATIVE
SCALE: 1" = 30'-0"

NO.	REVISION	DATE

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100% DESIGN DEVELOPMENT SET

Job Number:
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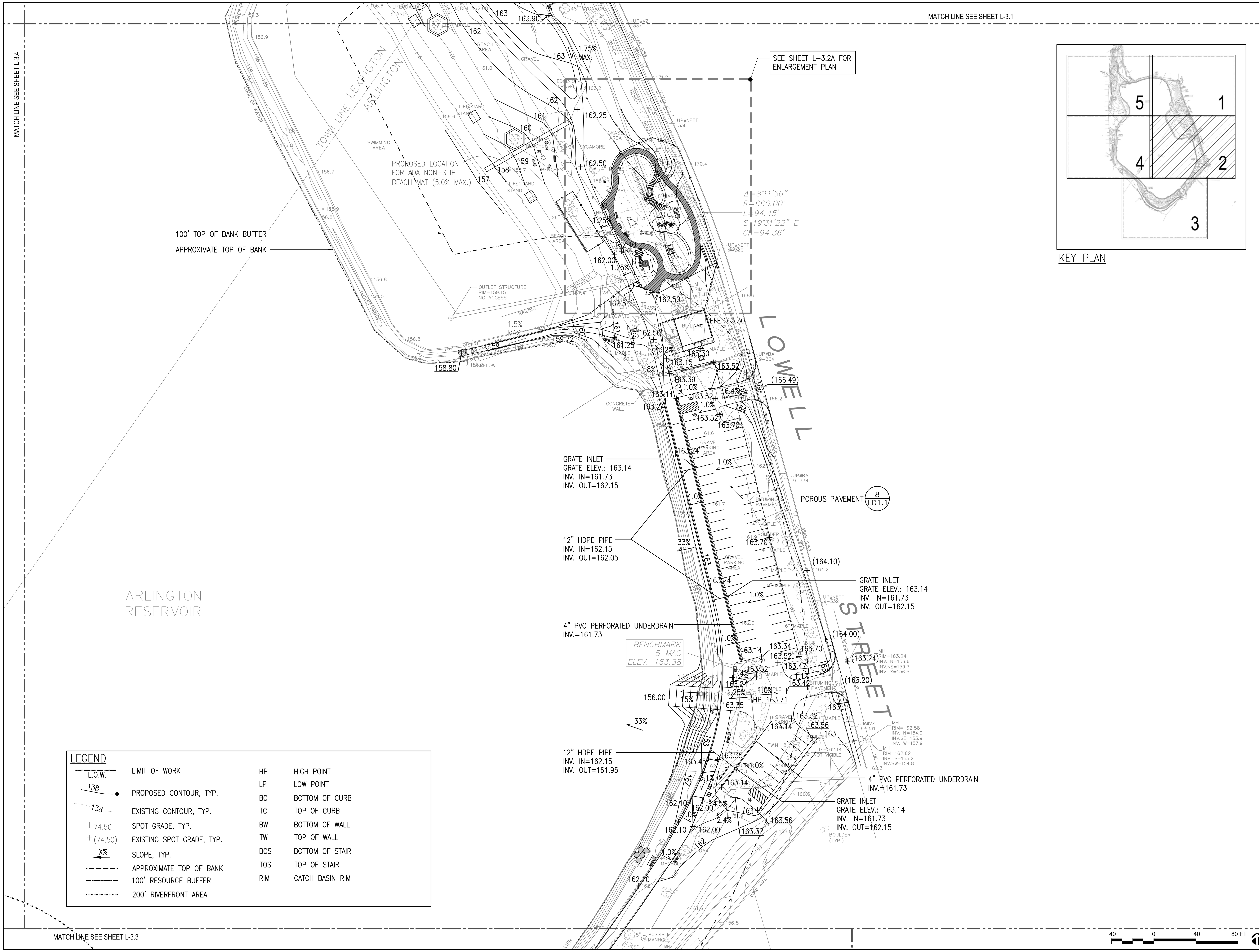
Scale: 1"=40'-0"
Drawing Title:

GRADING PLAN

L3.1



ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

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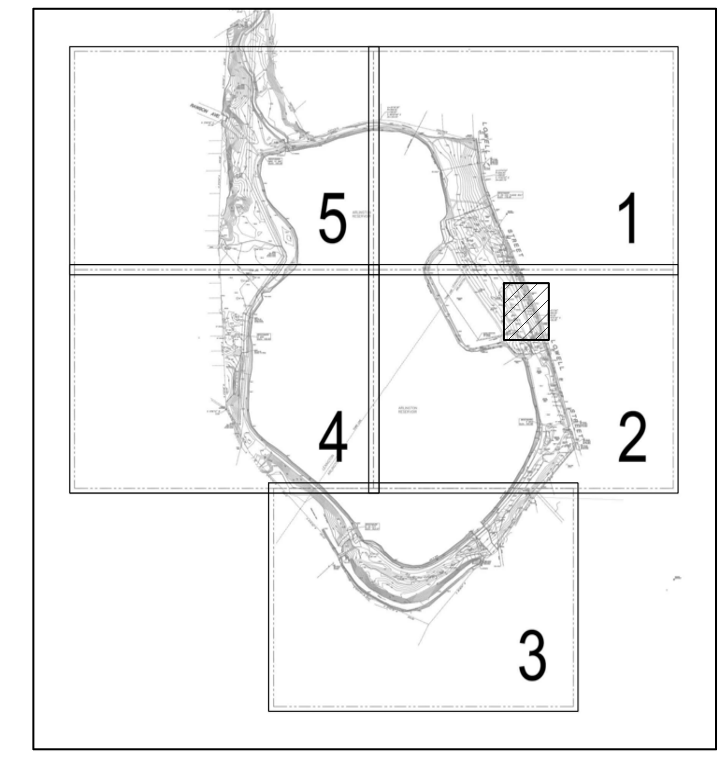
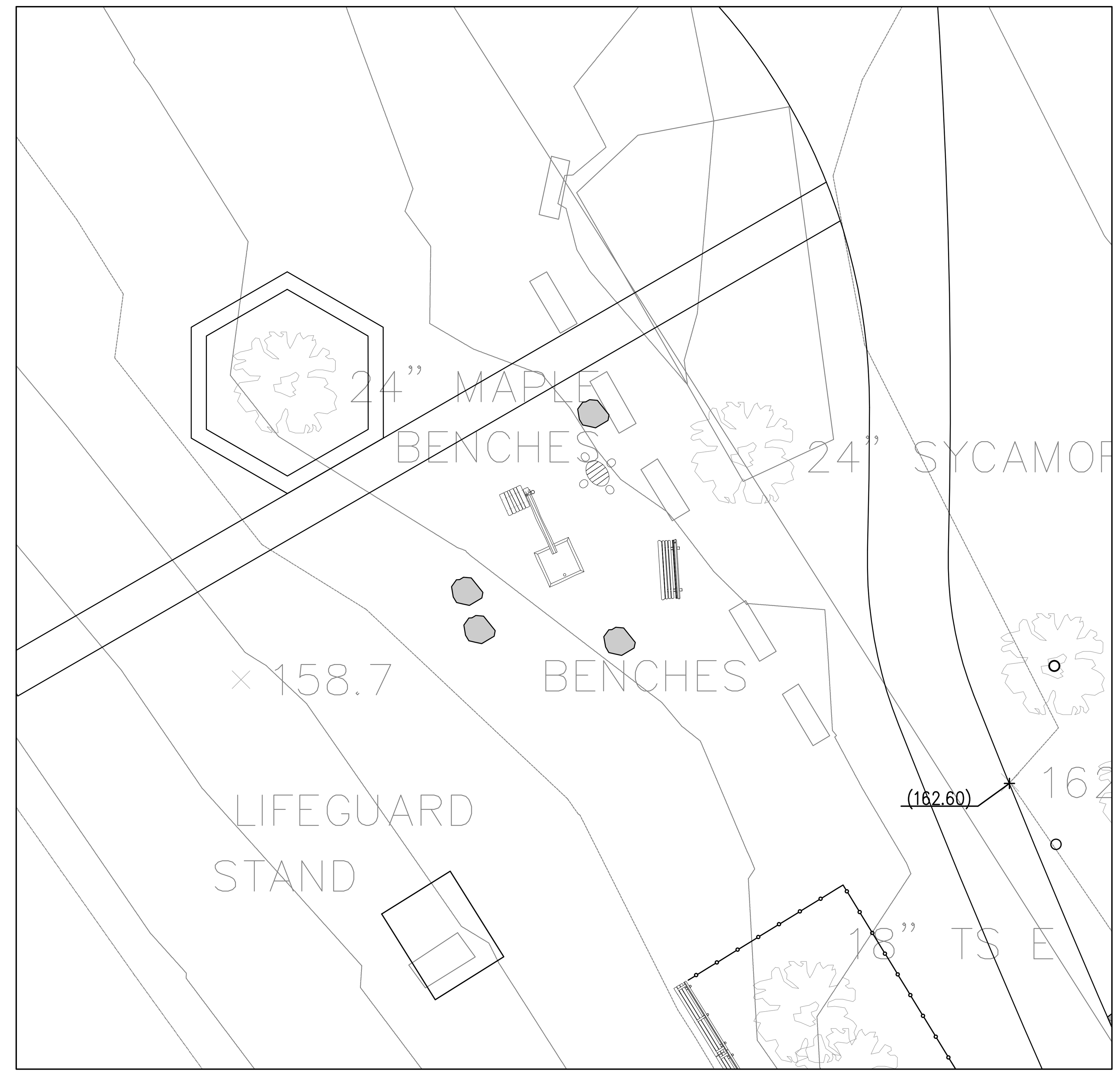
Drawing Title:

GRADING PLAN

L3.2



KEY PLAN



LEGEND

L.O.W.	LIMIT OF WORK	HP	HIGH POINT
138	PROPOSED CONTOUR, TYP.	LP	LOW POINT
138	EXISTING CONTOUR, TYP.	BC	BOTTOM OF CURB
74.50	SPOT GRADE, TYP.	TC	TOP OF CURB
(74.50)	EXISTING SPOT GRADE, TYP.	BW	BOTTOM OF WALL
X%	SLOPE, TYP.	TW	TOP OF WALL
	APPROXIMATE TOP OF BANK	BOS	BOTTOM OF STAIR
	100' RESOURCE BUFFER	TOS	TOP OF STAIR
	200' RIVERFRONT AREA	RIM	CATCH BASIN RIM

10 0 10 20 FT

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

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COMMONWEALTH OF MASSACHUSETTS KYLE S. ZICK REGISTERED LANDSCAPE ARCHITECT

100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
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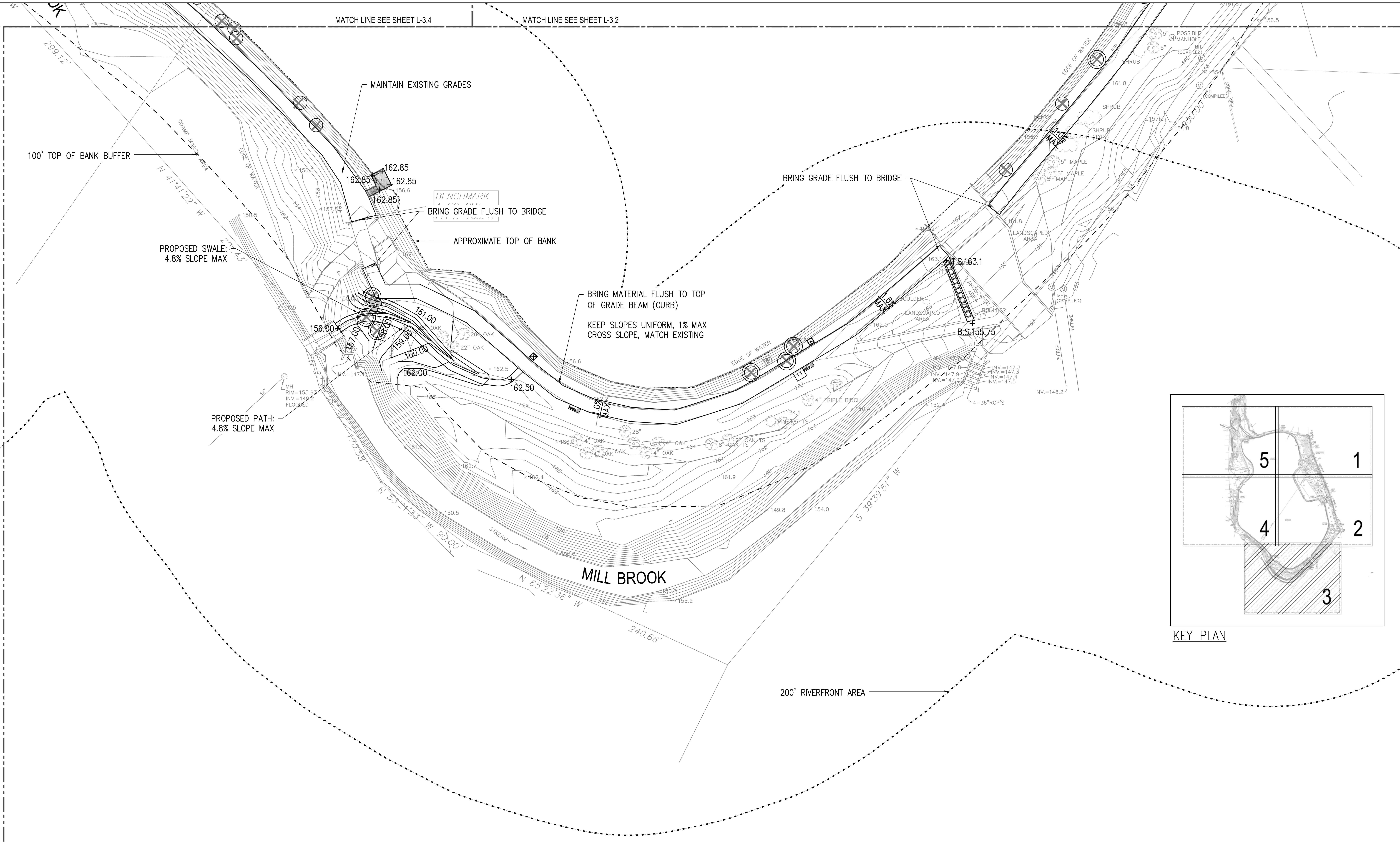
Scale: 1"=10'-0"
Drawing Title:

ENLARGED GRADING PLAN

L3.2A



LEGEND

L.O.W.	LIMIT OF WORK
138	PROPOSED CONTOUR, TYP.
138	EXISTING CONTOUR, TYP.
+74.50	SPOT GRADE, TYP.
+(74.50)	EXISTING SPOT GRADE, TYP.
X%	SLOPE, TYP.
	APPROXIMATE TOP OF BANK
	100' RESOURCE BUFFER
	200' RIVERFRONT AREA

HP	HIGH POINT
LP	LOW POINT
BC	BOTTOM OF CURB
TC	TOP OF CURB
BW	BOTTOM OF WALL
TW	TOP OF WALL
BOS	BOTTOM OF STAIR
TOS	TOP OF STAIR
RIM	CATCH BASIN RIM

40 0 40 80 FT

ARLINGTON RESERVOIR - PHASE 2

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MASSACHUSETTS KYLE S. ZICK REGISTERED LANDSCAPE ARCHITECT

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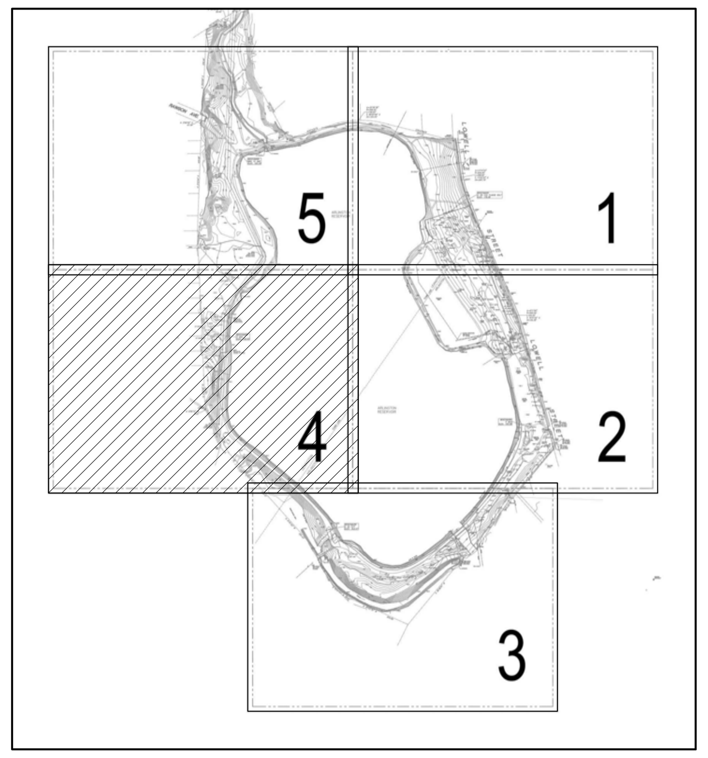
Drawing Title:

GRADING PLAN

L3.3



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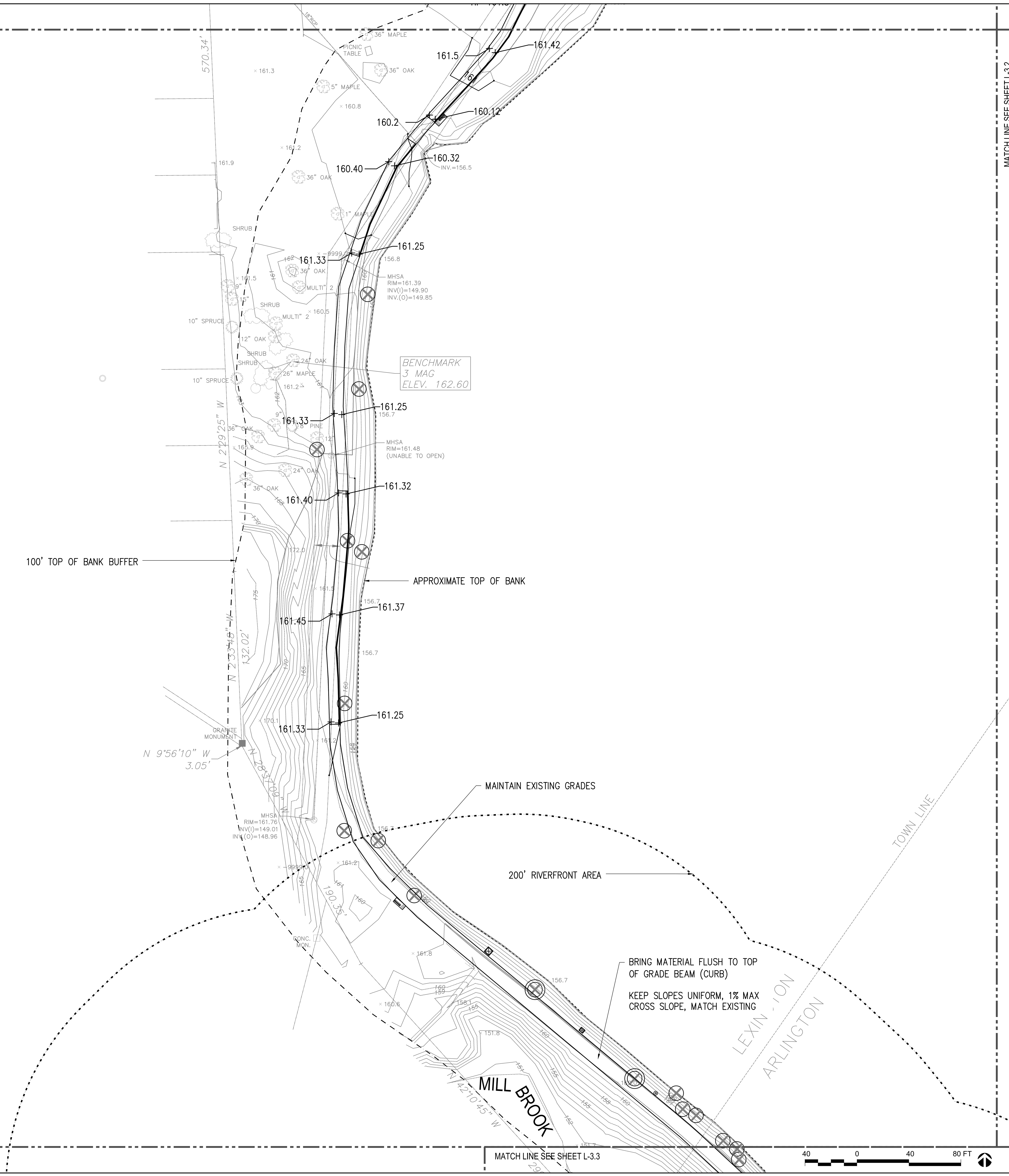

LEGEND

L.O.W.	LIMIT OF WORK	HP	HIGH POINT
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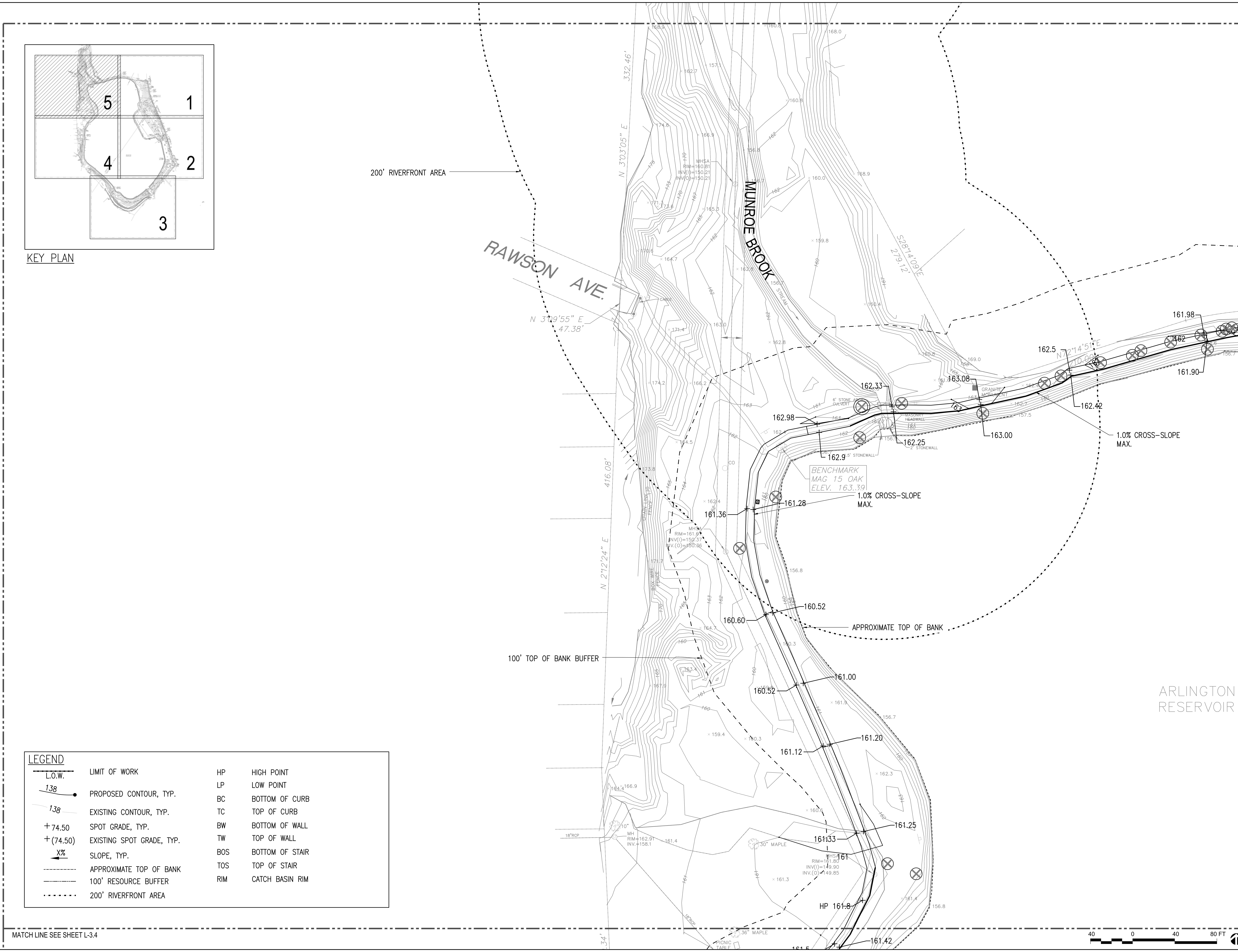
GRADING PLAN

L3.4



LEGEND

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		BC	BOTTOM OF CURB
138	EXISTING CONTOUR, TYP.	TC	TOP OF CURB
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+(74.50)	EXISTING SPOT GRADE, TYP.	TW	TOP OF WALL
X%	SLOPE, TYP.	BOS	BOTTOM OF STAIR
	APPROXIMATE TOP OF BANK	TOS	TOP OF STAIR
	100' RESOURCE BUFFER	RIM	CATCH BASIN RIM
	200' RIVERFRONT AREA		

ARLINGTON RESERVOIR - PHASE 2

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MASSACHUSETTS KYLE S. ZICK No. 1150 REGISTERED LANDSCAPE ARCHITECT

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GRADING PLAN

L3.5

MATCH LINE SEE SHEET L-4.5

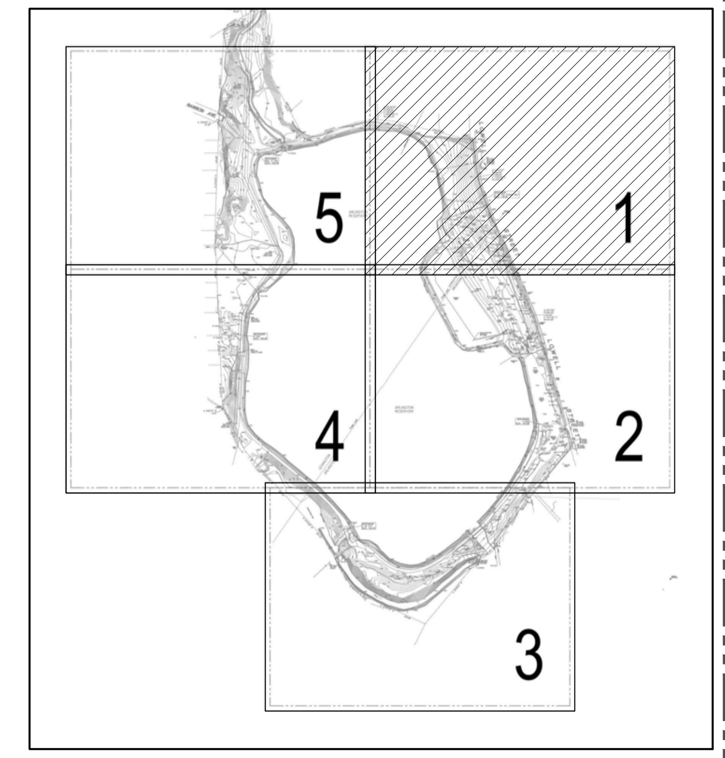
LEGEND

- L.O.W. — LIMIT OF WORK
- EXISTING TREE
- DECIDUOUS TREE (7 / LD1.9)
- EVERGREEN TREE (8 / LD1.9)
- SHRUB PLANTING (6 / LD1.9)
- PERENNIAL PLANTING (5 / LD1.9)
- SEEDING (4 / LD1.9)
- APPROXIMATE TOP OF BANK
- 100' TOP OF BANK BUFFER
- 200' RIVERFRONT AREA

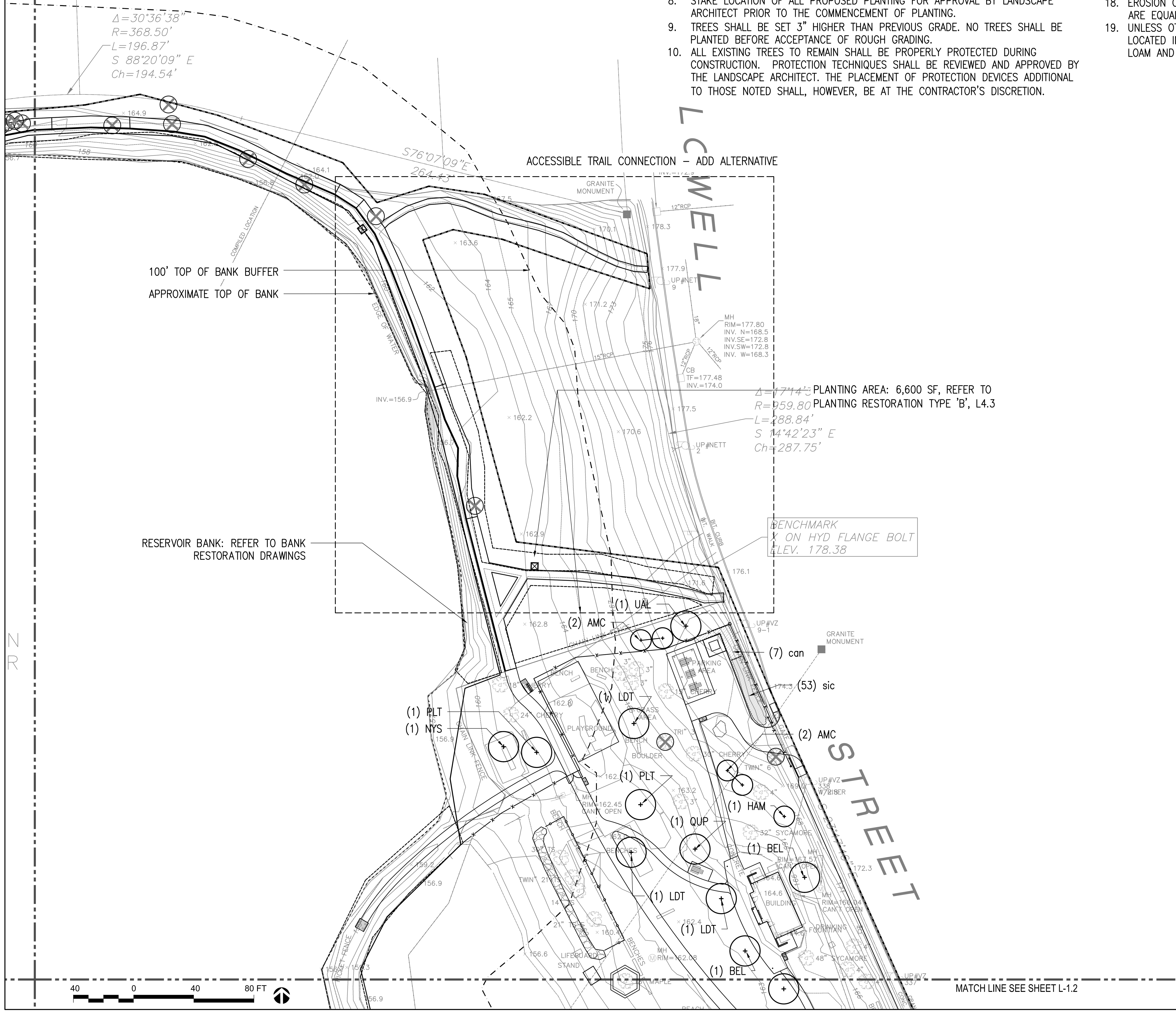
** SEE SHEET L4.2A FOR PLANT SCHEDULE-BEACH & PLAYGROUND AREA
SEE SHEET L4.4 FOR PLANT SCHEDULE-TRAIL AREA A AND B

PLANTING NOTES:

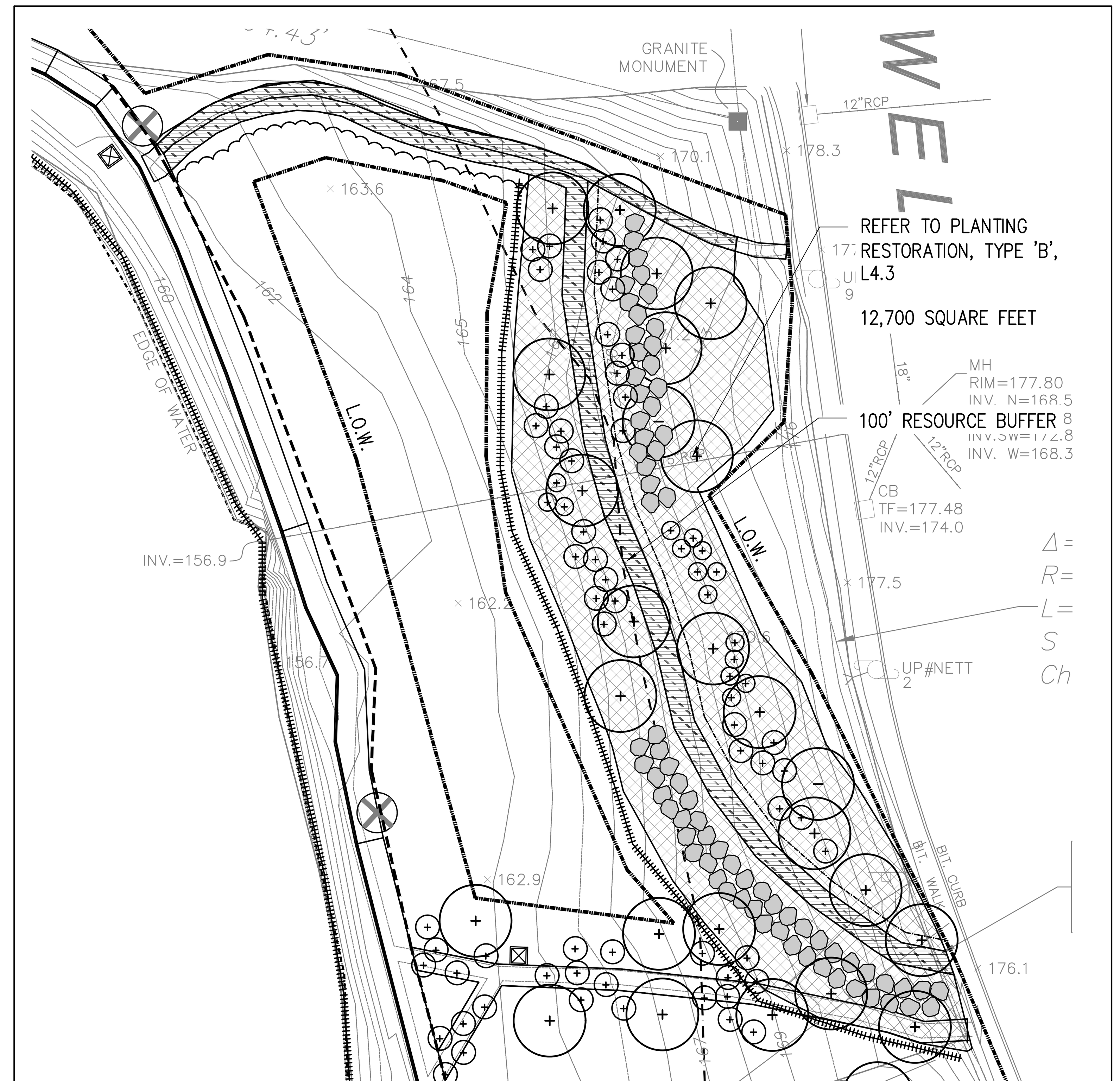
1. IF DISCREPANCIES EXIST BETWEEN THE NUMBER OF PLANTS DRAWN ON THE PLANTING PLAN AND THE NUMBER OF PLANTS IN THE PLANT LIST, THE PLANTING PLAN SHALL GOVERN.
2. ALL NEW PLANT MATERIAL SHALL CONFORM TO THE MINIMUM GUIDELINES ESTABLISHED FOR NURSERY STOCK PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN, INC. IN ADDITION, ALL NEW PLANT MATERIAL FOR THE PROJECT SHALL BE OF SPECIMEN QUALITY.
3. ALL NEW PLANTS TO BE BALLED AND BURLAPPED OR CONTAINER-GROWN, UNLESS OTHERWISE NOTED ON THE PLANT SCHEDULE.
4. THE CONTRACTOR SHALL SUPPLY ALL NEW PLANT MATERIAL IN QUANTITIES SUFFICIENT TO COMPLETE THE PLANTING SHOWN ON THE DRAWINGS.
5. ANY PROPOSED SUBSTITUTIONS OF PLANT SPECIES SHALL BE MADE WITH PLANTS OF EQUIVALENT OVERALL FORM, HEIGHT, BRANCHING HABIT, FLOWER, LEAF, COLOR, FRUIT AND CULTURE, AND SHALL BE NATIVE PLANTS ON THE OLMSTED PLANTING LIST. ALL SUBSTITUTIONS SHALL REQUIRE WRITTEN APPROVAL OF THE LANDSCAPE ARCHITECT.
6. ALL NEW PLANTS SHALL BE TAGGED AND APPROVED BY THE LANDSCAPE ARCHITECT AT THE NURSERY PRIOR TO DIGGING OR DELIVERY TO THE SITE.
7. CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITY LINES PRIOR TO PLANTING AND SHALL REPORT ANY CONFLICTS TO THE LANDSCAPE ARCHITECT.
8. STAKE LOCATION OF ALL PROPOSED PLANTING FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO THE COMMENCEMENT OF PLANTING.
9. TREES SHALL BE SET 3" HIGHER THAN PREVIOUS GRADE. NO TREES SHALL BE PLANTED BEFORE ACCEPTANCE OF ROUGH GRADING.
10. ALL EXISTING TREES TO REMAIN SHALL BE PROPERLY PROTECTED DURING CONSTRUCTION. PROTECTION TECHNIQUES SHALL BE REVIEWED AND APPROVED BY THE LANDSCAPE ARCHITECT. THE PLACEMENT OF PROTECTION DEVICES ADDITIONAL TO THOSE NOTED SHALL, HOWEVER, BE AT THE CONTRACTOR'S DISCRETION.
11. CONTRACTOR SHALL PROVIDE FULL DEPTHS OF LOAM AS NOTED ON DETAILS AND AS SPECIFIED, FOR ALL PLANTING.
12. CONTRACTOR SHALL COORDINATE LOCATION OF ALL UTILITIES (LINES, DUCTS, CONDUITS, SLEEVES, FOOTINGS, ETC.) WITH LOCATIONS OF PROPOSED LANDSCAPE ELEMENTS (WALLS, FENCES, FOOTINGS, TREE ROOTBALLS, PROPOSED LIGHTING FOOTINGS, ETC.). CONTRACTOR SHALL REPORT ANY DISCREPANCIES TO LANDSCAPE ARCHITECT PRIOR TO CONTINUING WORK.
13. LIMIT OF WORK LINE IS NOTED ON DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE DUE TO OPERATIONS INSIDE AND OUTSIDE OF THE CONTRACT LIMIT LINE. ANY AREA OUTSIDE THE LIMIT OF WORK THAT IS DISTURBED SHALL BE RESTORED TO ITS ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
14. IN AREAS WHERE EXISTING PAVEMENTS ARE REMOVED AND ARE PROPOSED AS LAWN, THE CONTRACTOR SHALL REMOVE THE PAVEMENT AND BASE, PROVIDE FILL AND 6" TOPSOIL PRIOR TO SEEDING.
15. CONTRACTOR SHALL PROVIDE PRUNING BY CERTIFIED ARBORIST. PRUNING SHALL BE REVIEWED WITH LANDSCAPE ARCHITECT PRIOR TO WORK.
16. ANY IDENTIFIED DEPRESSION SHALL BE FILLED WITH LOAM, SUFFICIENT TO ENSURE THAT SOIL IS LEVEL WITH SURROUNDING GRADE AFTER SETTLEMENT, AND SEEDED.
17. LOAM AND SEED ALL DISTURBED AREAS THAT ARE NOT PROPOSED AS PAVEMENT, INCLUDING AREAS OF INVASIVE REMOVAL AND STUMP REMOVAL.
18. EROSION CONTROL BLANKETS SHALL BE USED ON NEWLY GRADED SLOPES THAT ARE EQUAL TO OR STEEPER THAN A 3:1 SLOPE.
19. UNLESS OTHERWISE DESIGNATED, ALL INVASIVE MANAGEMENT AREAS, UNLESS LOCATED IN RIPRAP OR PROPOSED AS HARDSCAPE, SHALL BE TOP DRESSED WITH LOAM AND SEEDED.



KEY PLAN



MATCH LINE SEE SHEET L-1.2



ACCESSIBLE TRAIL CONNECTION - ADD ALTERNATIVE
SCALE: 1" = 30'-0"

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE

kzla
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617 451-1018 Tel
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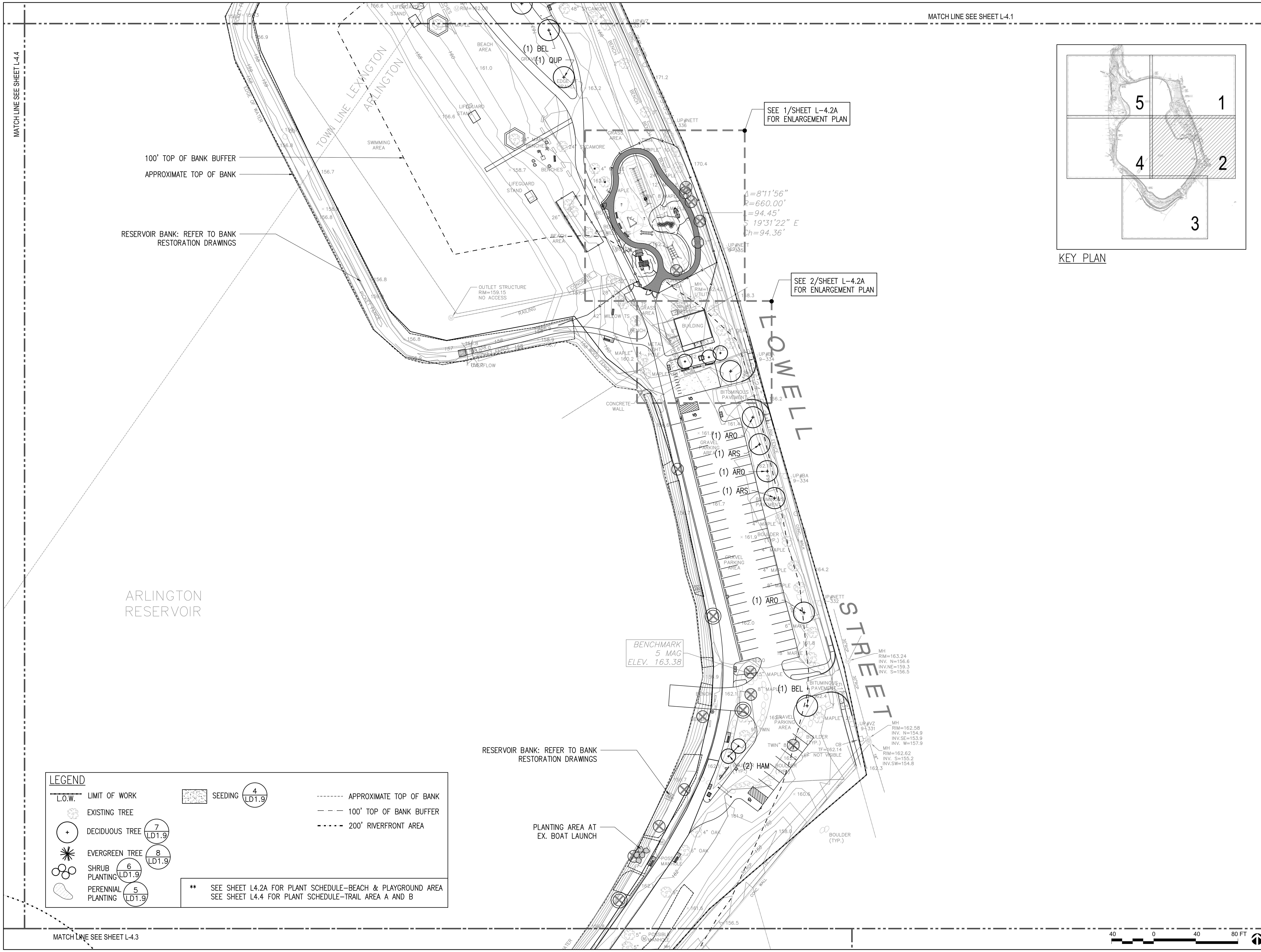
100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB
Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: 1"=40'-0"
Drawing Title:

PLANTING PLAN

L4.1



ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

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kzla
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MASSACHUSETTS KYLE S. ZICK REGISTERED LANDSCAPE ARCHITECT

100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: 1"=40'-0"
Drawing Title:

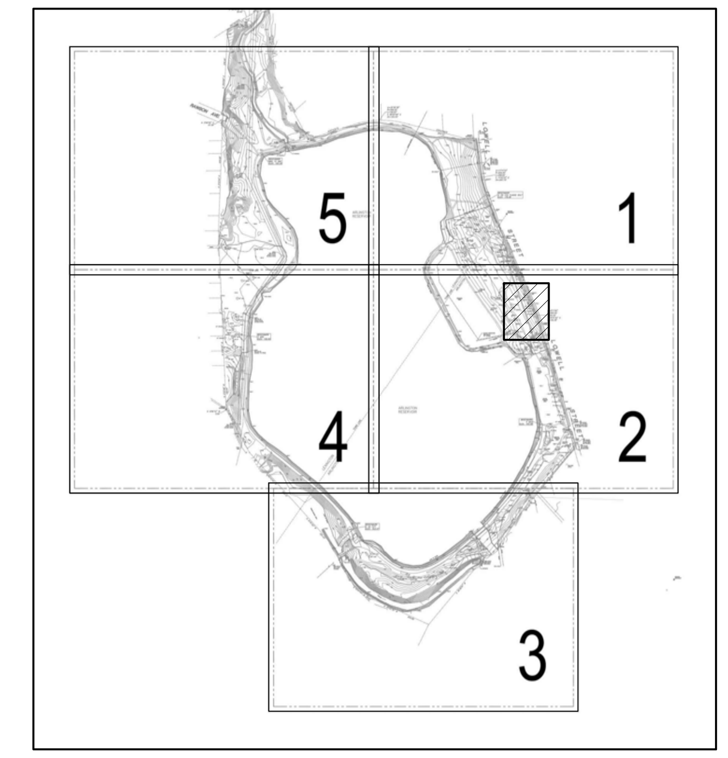
PLANTING PLAN

L4.2

LEGEND

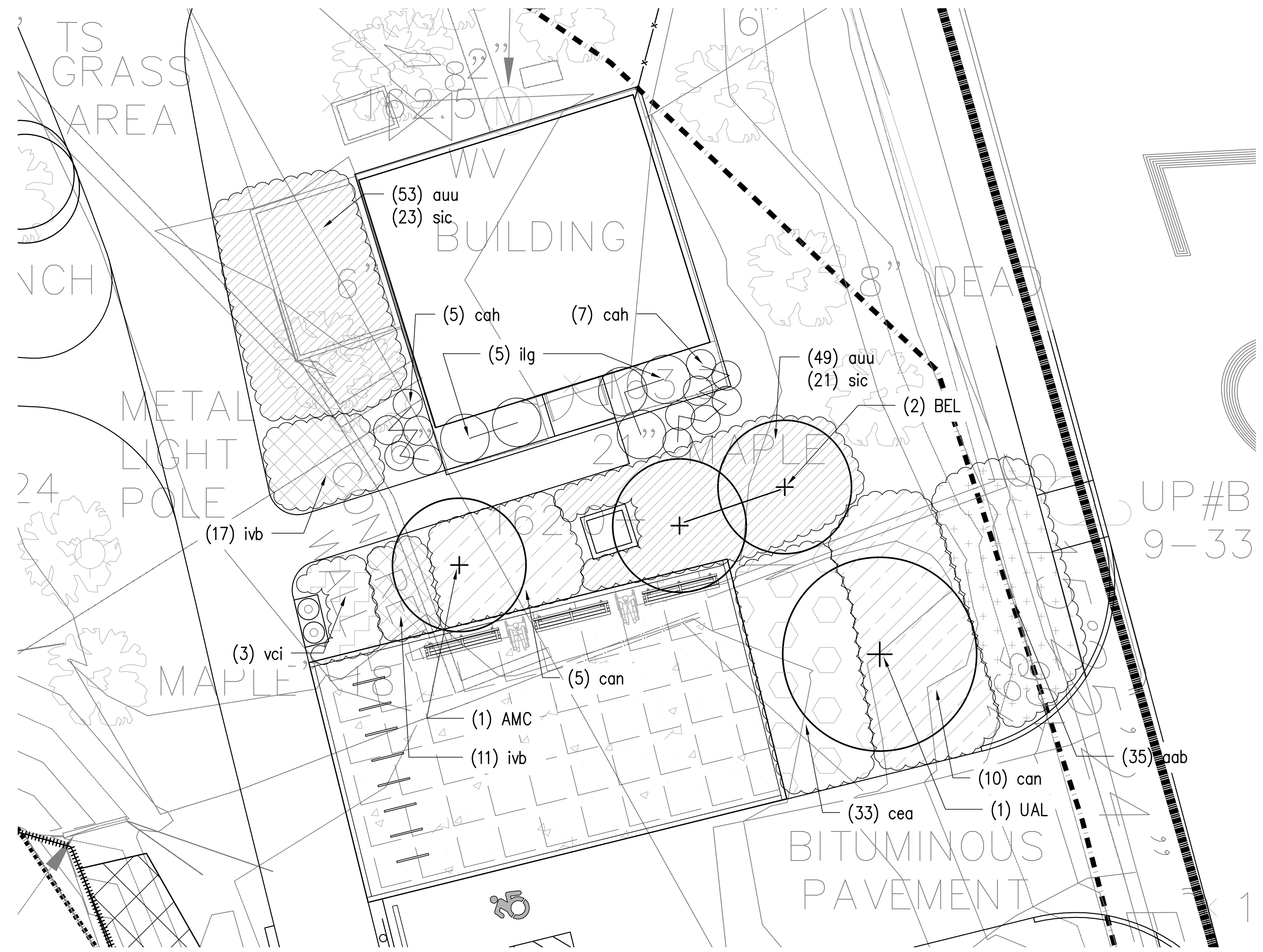
L.O.W.	LIMIT OF WORK
	EXISTING TREE
	DECIDUOUS TREE 7/LD1.9
	EVERGREEN TREE 8/LD1.9
	SHRUB PLANTING 6/LD1.9
	PERENNIAL PLANTING 5/LD1.9
	SEEDING 4/LD1.9
	APPROXIMATE TOP OF BANK
	100' TOP OF BANK BUFFER
	200' RIVERFRONT AREA

** SEE SHEET L4.2A FOR PLANT SCHEDULE-BEACH & PLAYGROUND AREA
SEE SHEET L4.4 FOR PLANT SCHEDULE-TRAIL AREA A AND B



KEY PLAN

1 ENLARGEMENT PLAN
SCALE: 1"=10'-0"



2 ENLARGEMENT PLAN
SCALE: 1"=10'-0"

PLANT SCHEDULE

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
		DECIDUOUS TREES		
AMC	5	AMENLANCHIER CANADENSIS	SERVICEBERRY	3" CAL.
ARS	3	ACER RUBRUM 'RED SUNSET'	RED MAPLE	3" CAL.
ARO	3	ACER RUBRUM 'OCTOBER GLORY'	RED MAPLE	3" CAL.
ASF	3	ACER SACCHARUM 'FALL FIESTA'	SUGAR MAPLE	3" CAL.
BEL	6	BETULA POPULIFOLIA	GRAY BIRCH	12' CLUMP
HAM	14	HAMAMELIS VIRGINIANA	WITCHHAZEL	8' CLUMP
LDT	3	LIRIODENDRON TULIPIFERA	TULIPTREE	3" CAL.
NYS	1	NYSSA SYLVATICA	TUPELO	2.5" CAL.
PLT	2	PLATANUS OCCIDENTALIS	SYCAMORE	2.5" CAL.
QUP	2	QUERCUS PALUSTRIS	PIN OAK	3" CAL.
UAP	3	ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM	2.5" CAL.
UAL	2	ULMUS AMERICANA 'JEFFERESON'	AMERICAN ELM	3" CAL.

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
		EVERGREEN TREES			
ACC	3	ABIES CONCOLOR	WHITE FIR	8-10' HT.	
		SHRUBS			
aab	35	ARONIA ARBUTIFOLIA 'BRILLIANTISSIMA'	RED CHOKEBERRY	5 GAL.	3'-0" O.C.
cah	12	CLETHRA ALNIFOLIA 'HUMMINGBIRD'	COMPACT SWEET PEPPERBUSH	5 GAL.	3'-0" O.C.
cea	33	CEANOTHUS AMERICANUS	NEW JERSEY TEA	5 GAL.	3'-0" O.C.
can	22	CORNUS AMOMUM	SILKY DOGWOOD	6 GAL.	6'-0" O.C.
ilg	5	ILEX GLABRA	INKBERRY	5 GAL.	5'-0" O.C.
ivb	28	ILEX VERTICILLATA 'BERRY POPPINS'	COMPACT WINTERBERRY	5 GAL.	2'-6" O.C.
vci	3	VIBURNUM CARLESII 'AURORA'	KOREANSPICE VIBURNUM	5 GAL.	5'-0" O.C.
		GROUNDCOVER			
auu	102	ARCTOSTAPHYLOS UVA-URSI	BEARBERRY	1 GAL.	24" O.C.
sic	97	STEPHANANDRA INCISA 'CRISPA'	CUTLEAF STEPHANANDRA	2 GAL.	36" O.C.

10 0 10 20 FT

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

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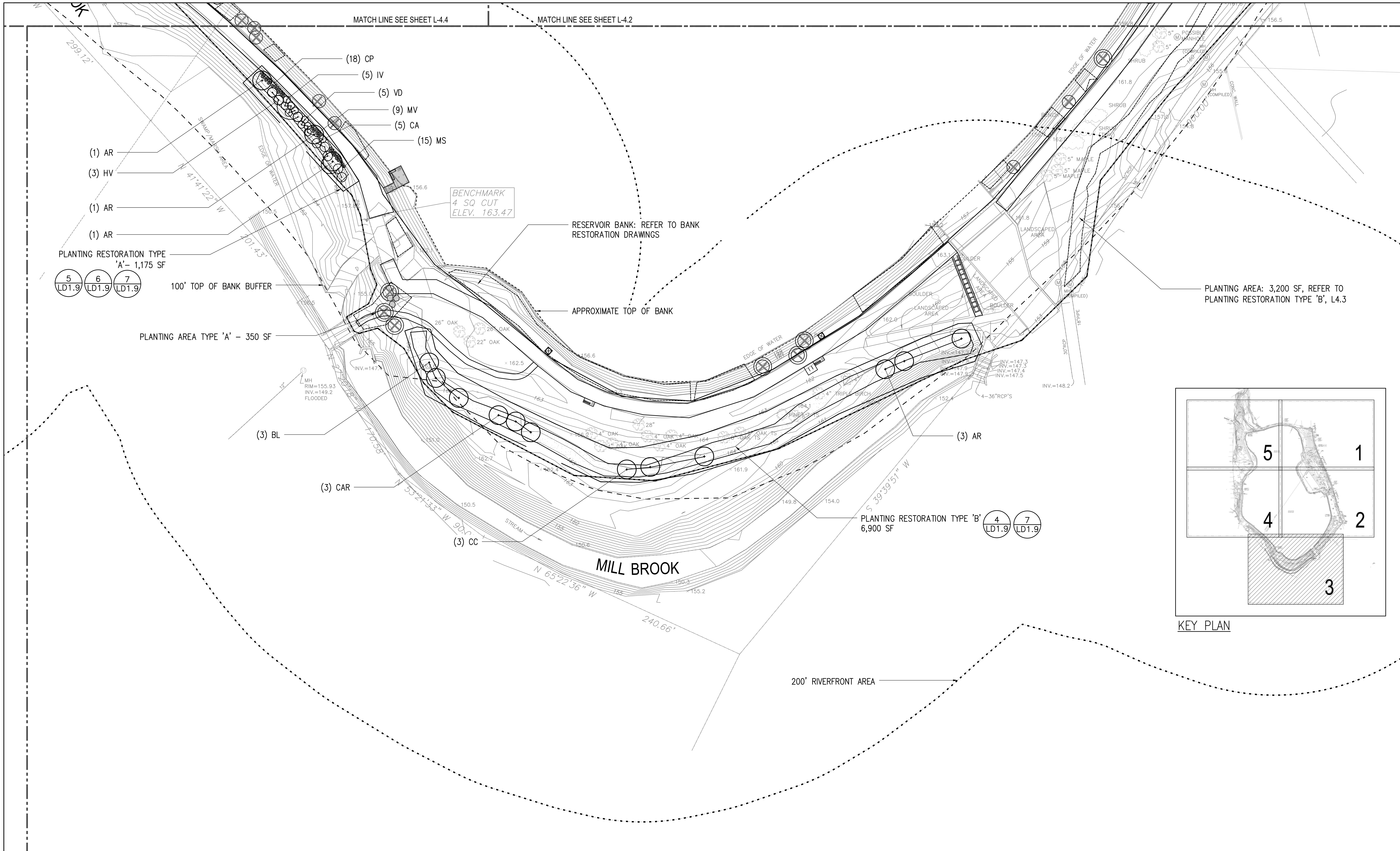
100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: 1"=10'-0"
Drawing Title:

ENLARGED PLANTING PLAN

L4.2A



LEGEND

- L.O.W. LIMIT OF WORK
- EXISTING TREE
- DECIDUOUS TREE (7 LD1.9)
- EVERGREEN TREE (8 LD1.9)
- SHRUB PLANTING (6 LD1.9)
- PERENNIAL PLANTING (5 LD1.9)
- SEEDING (4 LD1.9)
- APPROXIMATE TOP OF BANK
- 100' TOP OF BANK BUFFER
- 200' RIVERFRONT AREA

** SEE SHEET L4.2A FOR PLANT SCHEDULE–BEACH & PLAYGROUND AREA
SEE SHEET L4.4 FOR PLANT SCHEDULE–TRAIL AREA A AND B

40 0 40 80 FT

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

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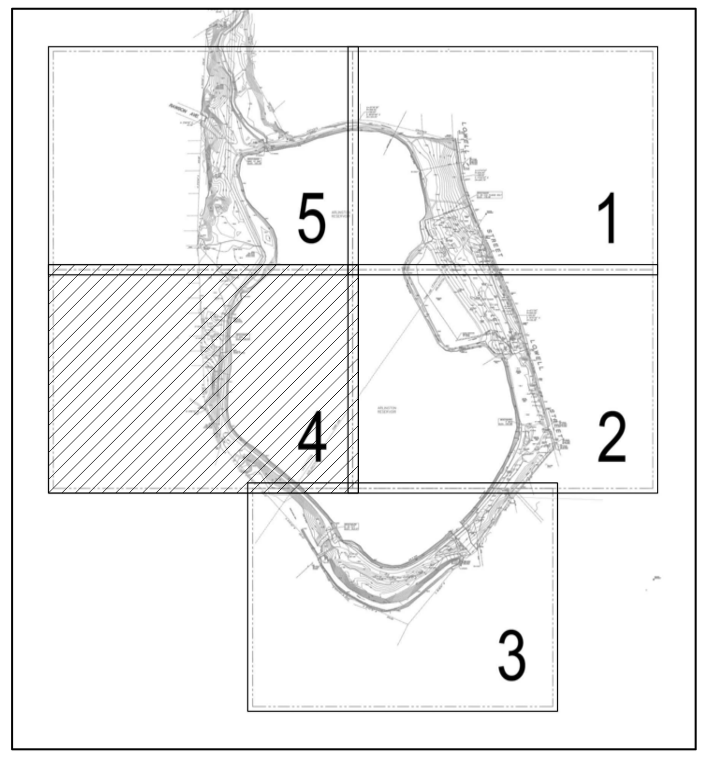
Drawing Title:

PLANTING PLAN

L4.3



KEY PLAN

PLANT SCHEDULE - Plant Restoration Type 'A'

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
		TREES			
AR	3	ACER RUBRUM 'OCTOBER GLORY'	RED MAPLE	1.5" CAL.	
HV	3	HAMAMELIS VIRGINIANA	WITCHHAZEL	4-5' CLUMP	
		SHRUBS			
CA	5	CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	5 GAL.	4'-6" O.C.
IV	5	ILEX VERTICILLATA 'BERRY POPPINS'	COMPACT WINTERBERRY	5 GAL.	2'-6" O.C.
VD	5	VIBURNUM DENTATUM 'BLUE MUFFIN'	COMPACT ARROWWOOD	5 GAL.	3'-0" O.C.
		PERENNIALS			
MV	9	MERTENSIA VIRGINICA	VIRGINIA BLUEBELLS	1 GAL.	12" O.C.
MS	15	MATTEUCCIA STRUTHIOPTERIS	OSTRICH FERN	1 GAL.	12" O.C.
CP	18	CAREX PENNSLYVANICA	PENSSYLVANIA SEDGE		

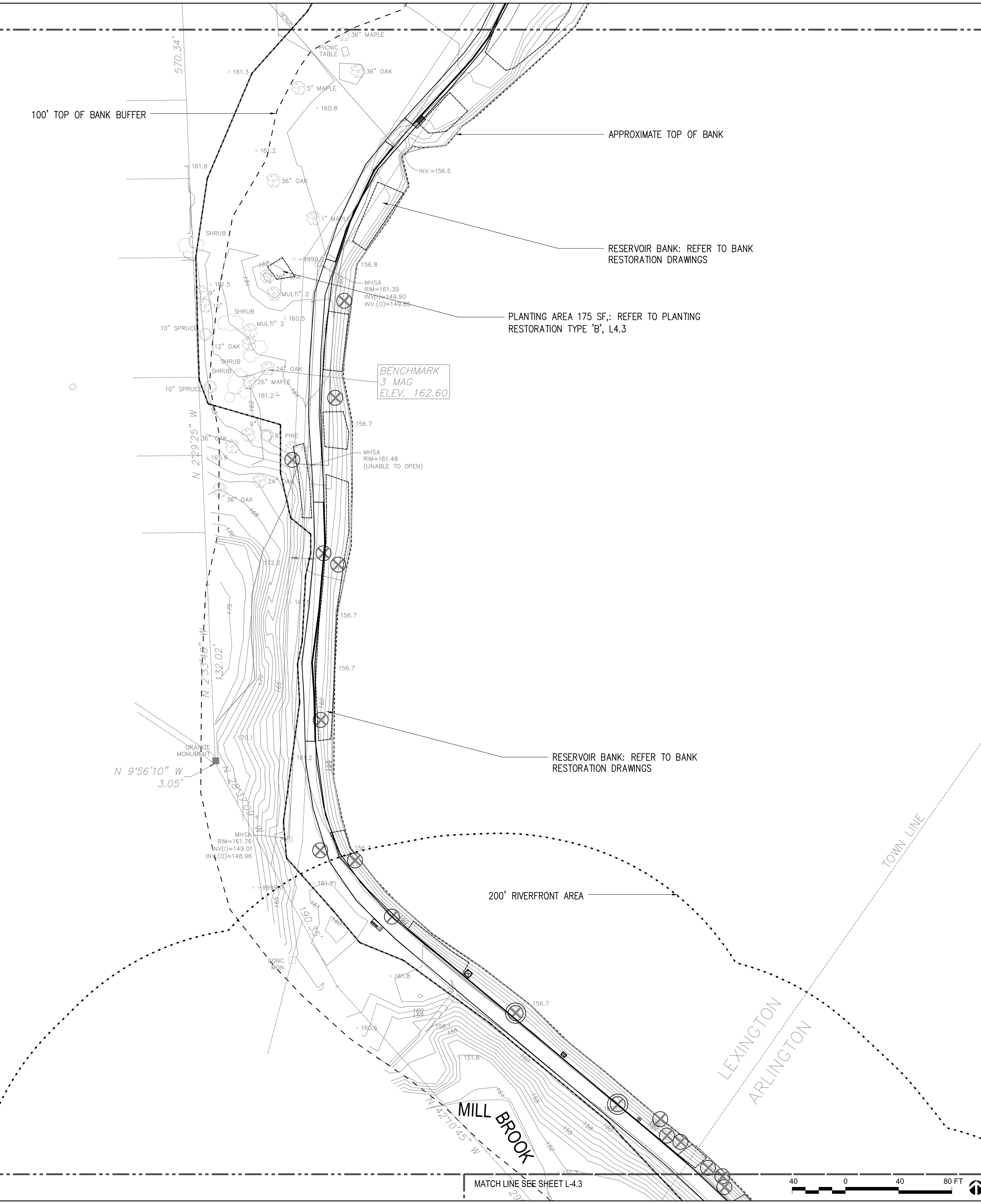
PLANT SCHEDULE - Plant Restoration Type 'B'

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
		TREES			
AR	3	ACER RUBRUM 'OCTOBER GLORY'	RED MAPLE	1.5" CAL.	
BL	3	BETULA LENTA	SWEET BIRCH	8' CLUMP	
CC	3	CARPINUS CAROLINIANA	AMERICAN HORNBEAM	3" CAL.	
CAR	3	CERCIS CANADENSIS 'APPALANCHIAN RED'	REDBUD	3" CAL.	
		SEED			
	6900 SF	NATIVE PERENNIAL RESTORATION SEED MIX: REFER TO SPECS			

LEGEND

- L.O.W. — LIMIT OF WORK
- EXISTING TREE
- DECIDUOUS TREE (7 / LD1.9)
- EVERGREEN TREE (8 / LD1.9)
- SHRUB PLANTING (6 / LD1.9)
- PERENNIAL PLANTING (5 / LD1.9)
- SEEDING (4 / LD1.9)
- APPROXIMATE TOP OF BANK
- 100' TOP OF BANK BUFFER
- 200' RIVERFRONT AREA

** SEE SHEET L4.2A FOR PLANT SCHEDULE–BEACH & PLAYGROUND AREA
SEE SHEET L4.4 FOR PLANT SCHEDULE–TRAIL AREA A AND B



ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

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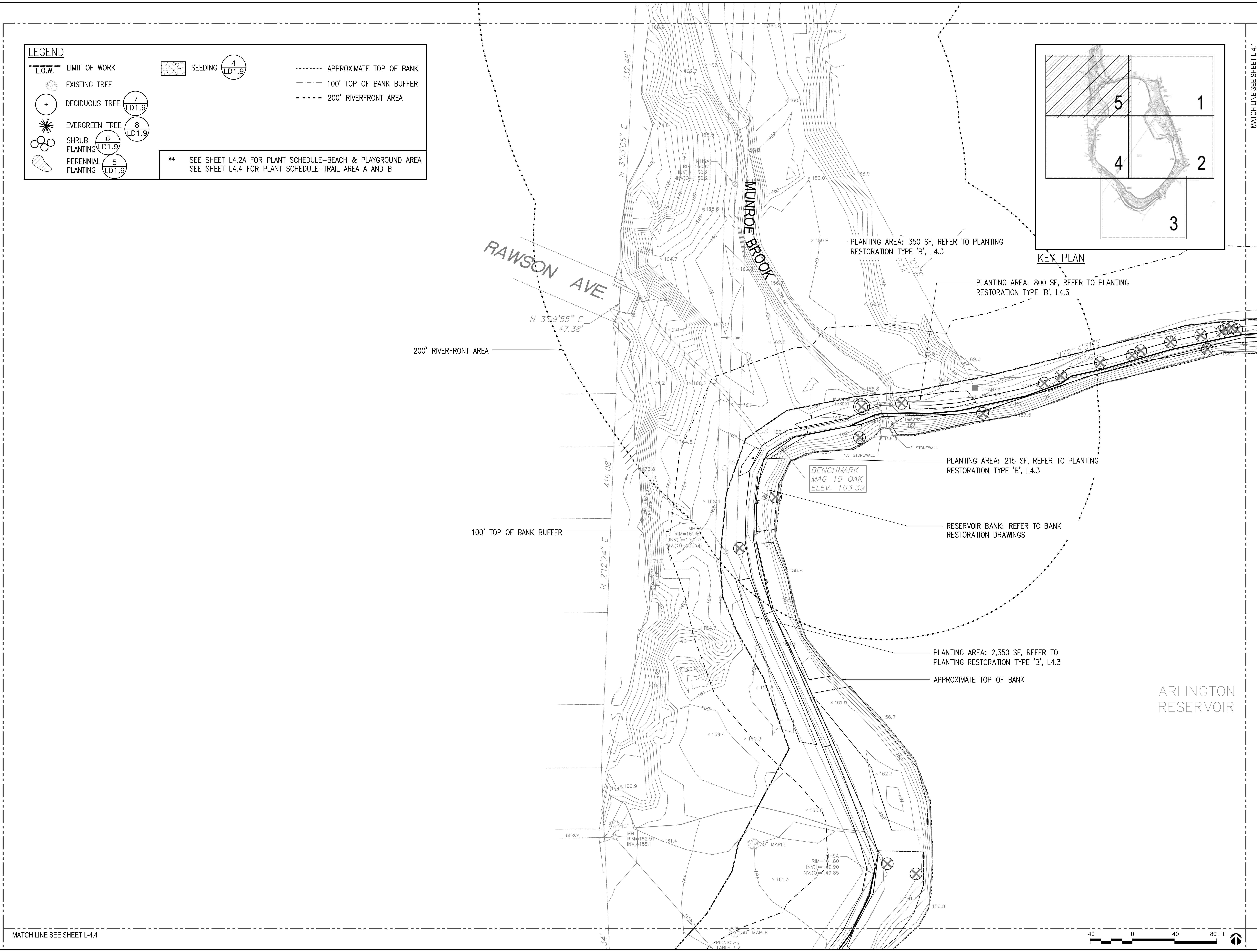
Scale: 1"=40'-0"
Drawing Title:

PLANTING PLAN

L4.4



ARLINGTON RESERVOIR - PHASE 2

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Project: ARLINGTON RES.
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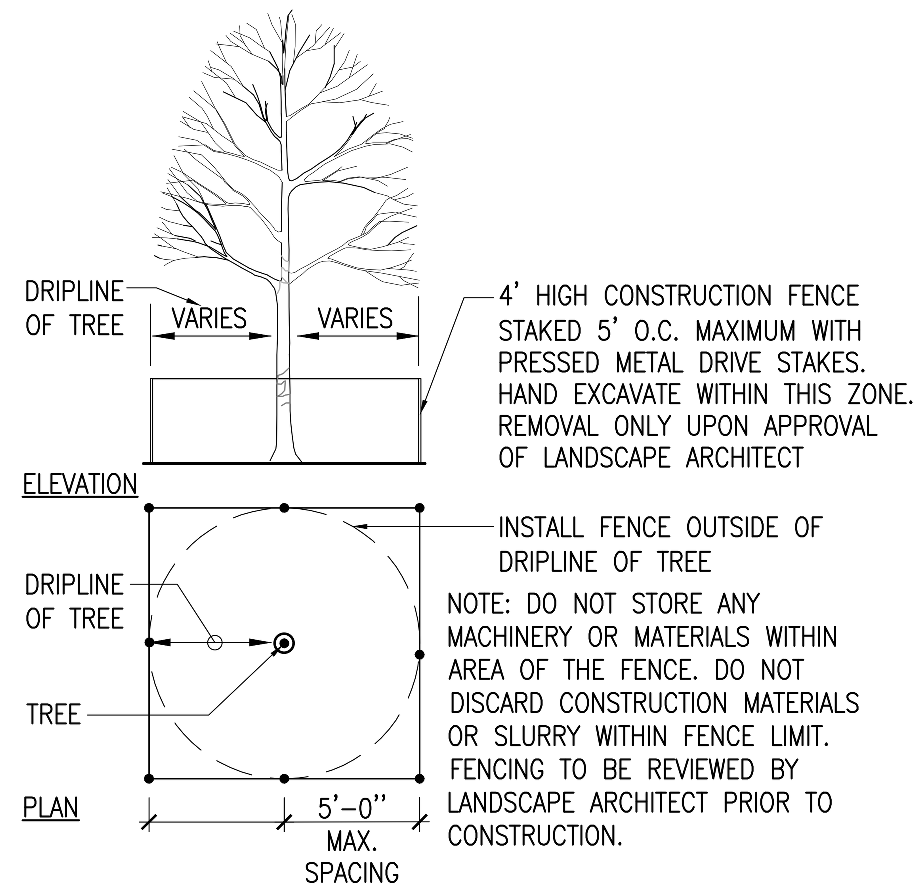
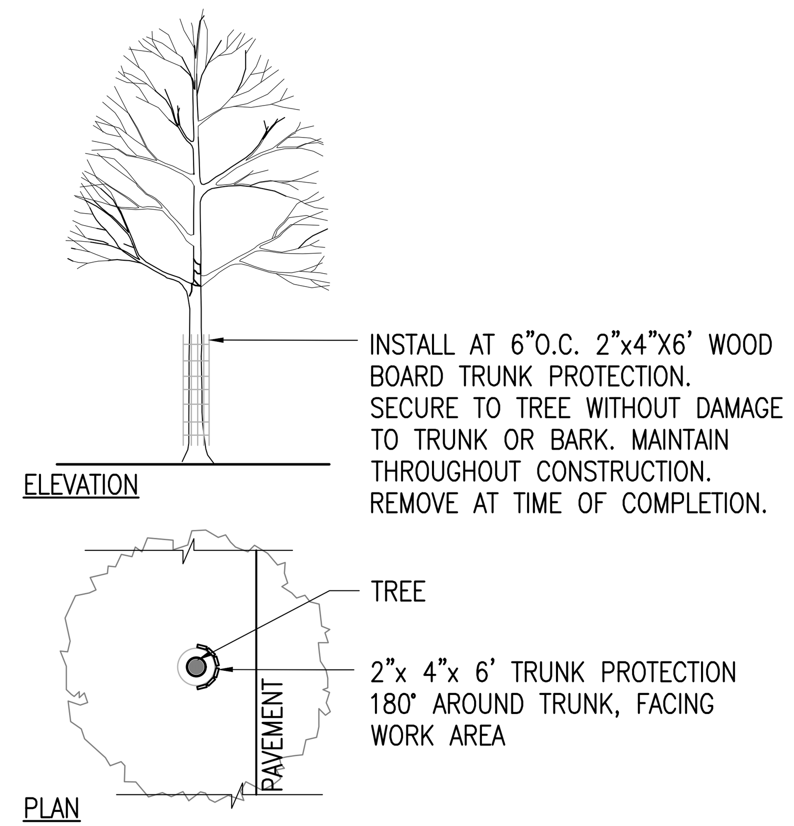
Scale: 1"=40'-0"
Drawing Title:

PLANTING PLAN

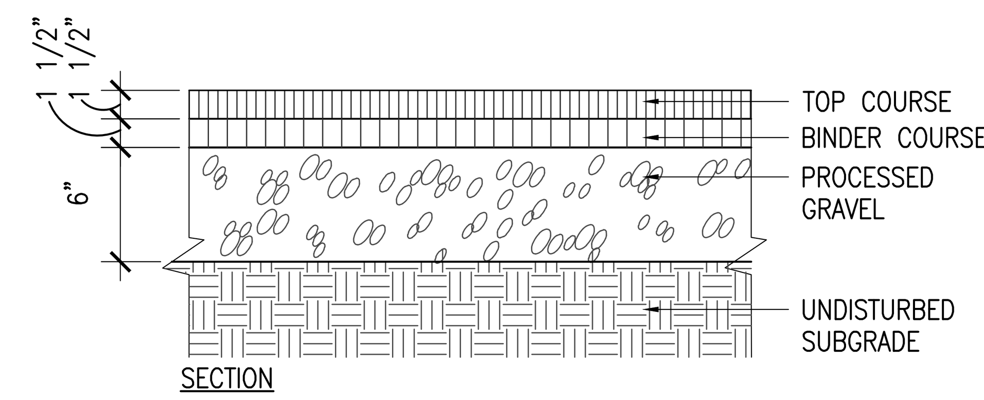
L4.5



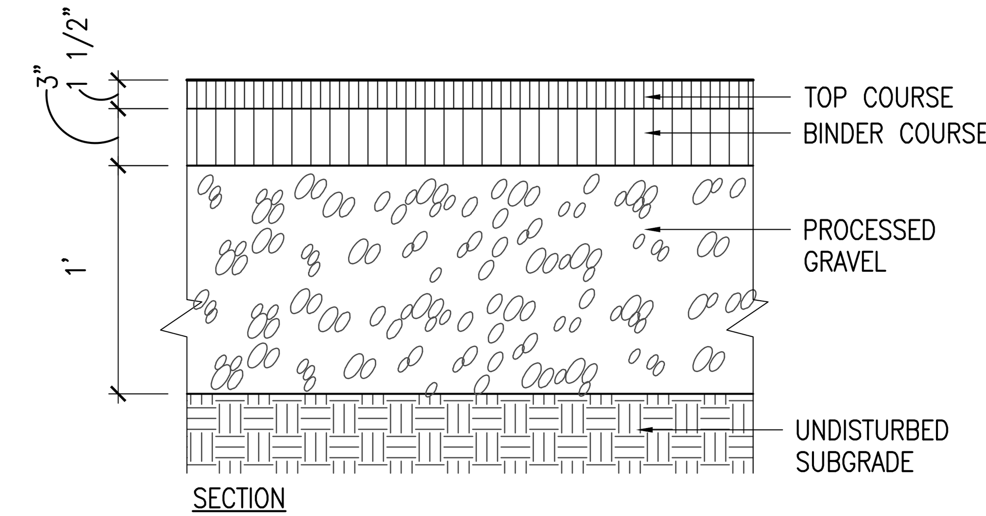
1 TREE PROTECTION - FENCE
SCALE: N.T.S.



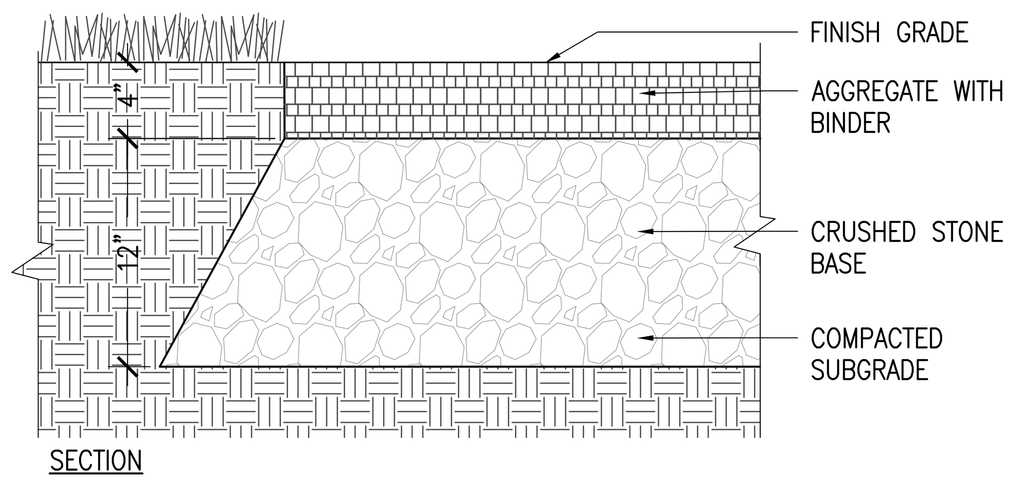
4 TREE PROTECTION - WOOD BOARD
SCALE: N.T.S.



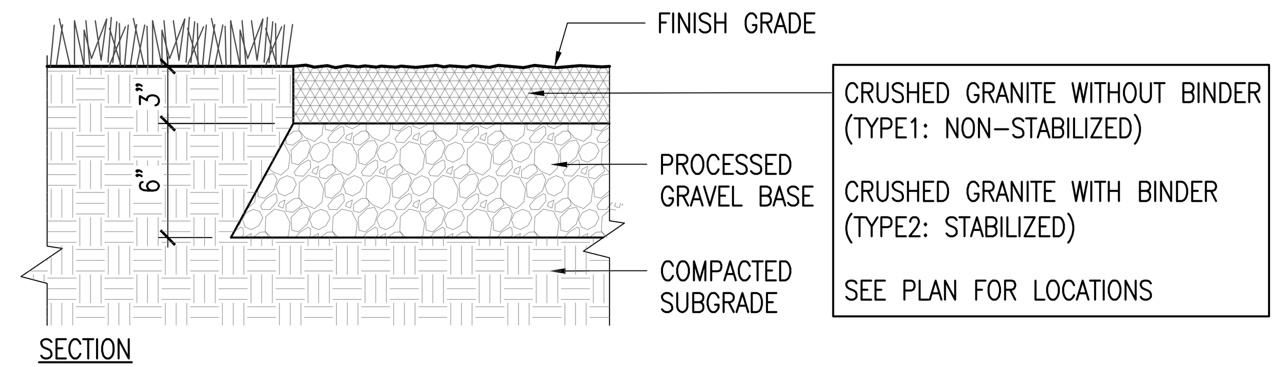
7 PEDESTRIAN ASPHALT
SCALE: 1 1/2" = 1'-0"



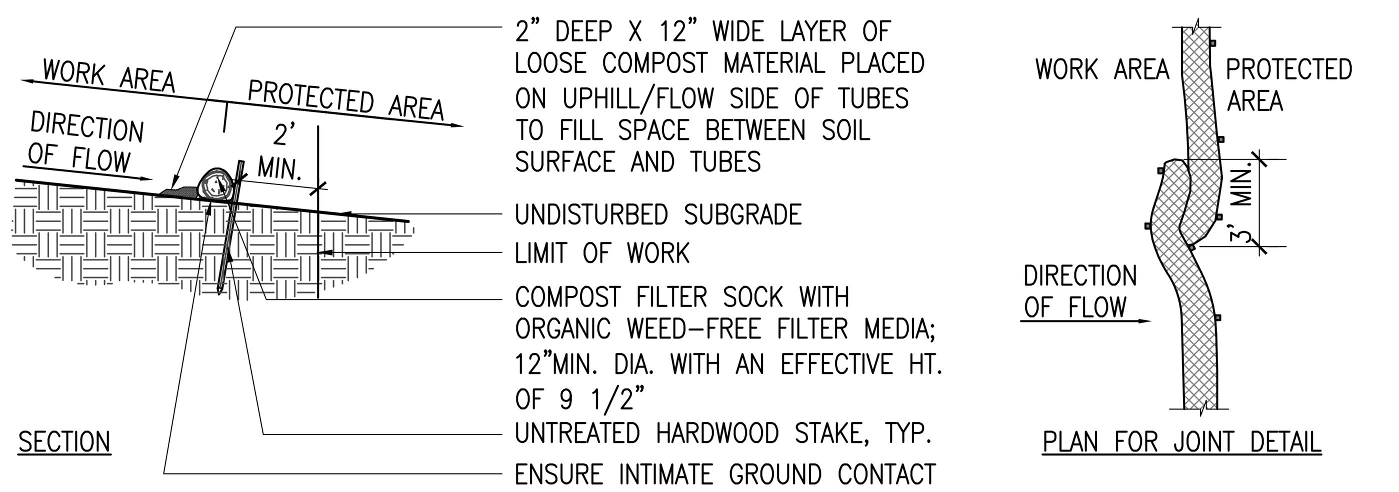
9 VEHICULAR ASPHALT
SCALE: 1 1/2" = 1'-0"



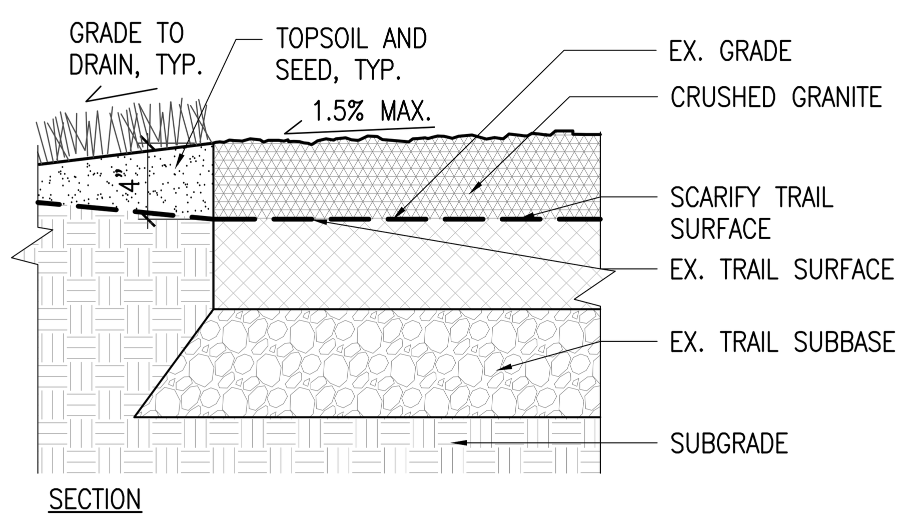
8 POROUS PAVEMENT
SCALE: 1 1/2" = 1'-0"



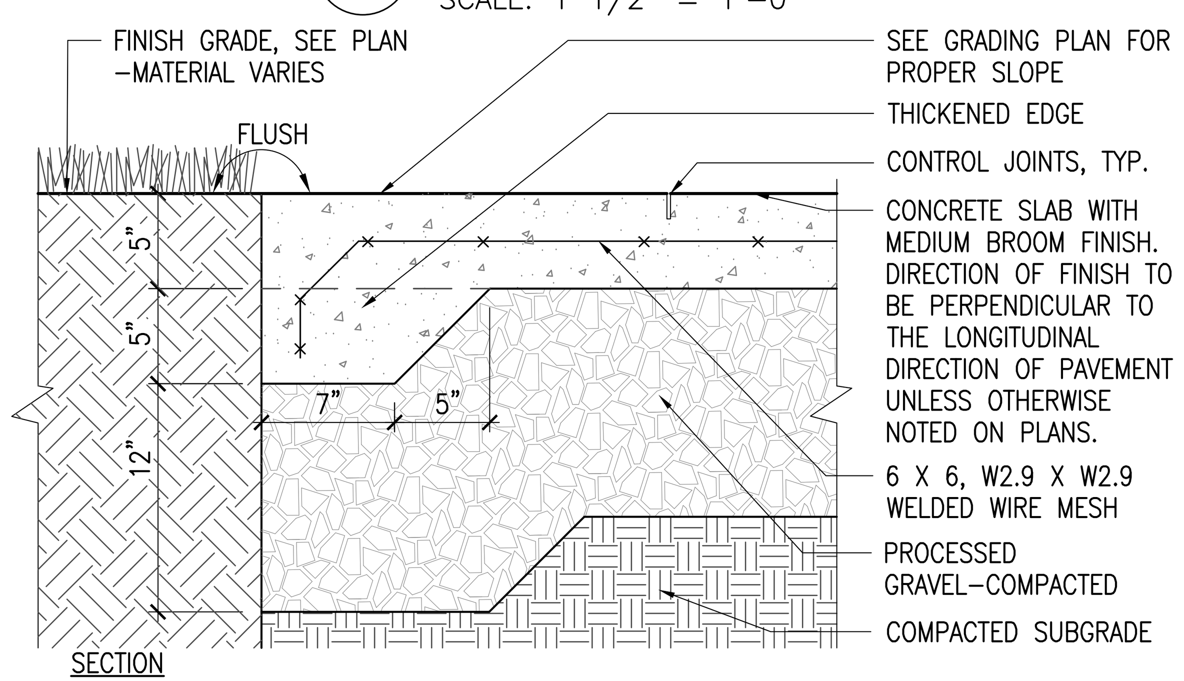
10 CRUSHED GRANITE PAVEMENT
SCALE: 1 1/2" = 1'-0"

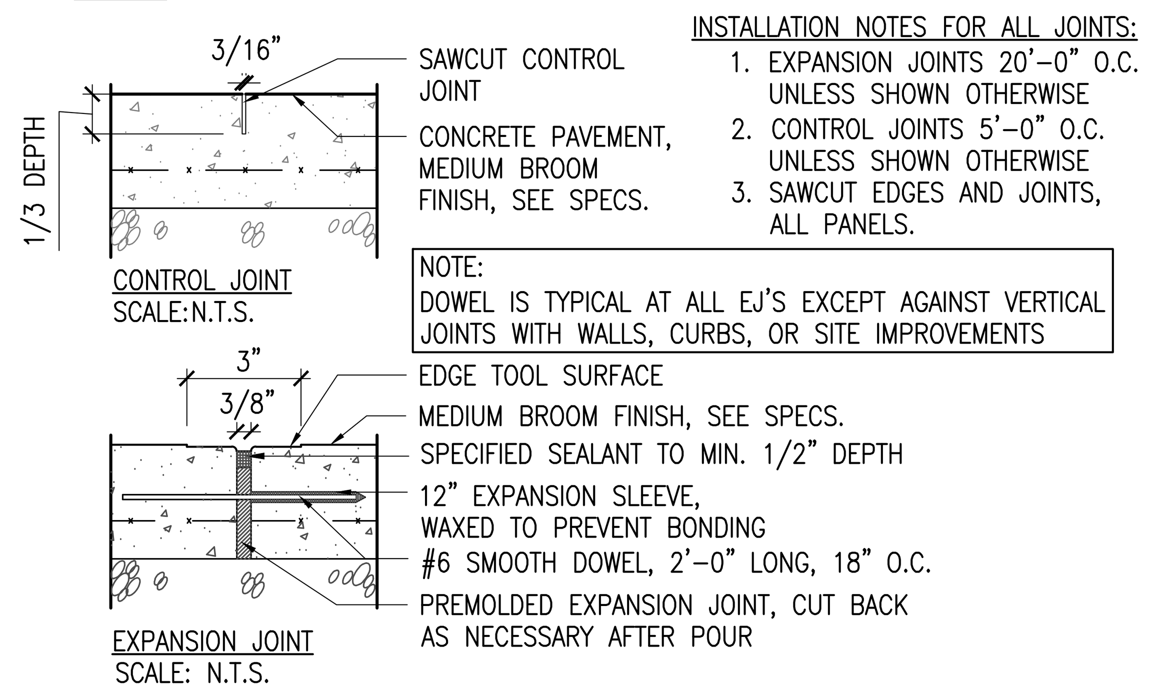


2 EROSION CONTROL - COMPOST FILTER SOCK
SCALE: N.T.S.



11 RESTORE EXISTING STONEDUST TRAIL
SCALE: 1 1/2" = 1'-0"

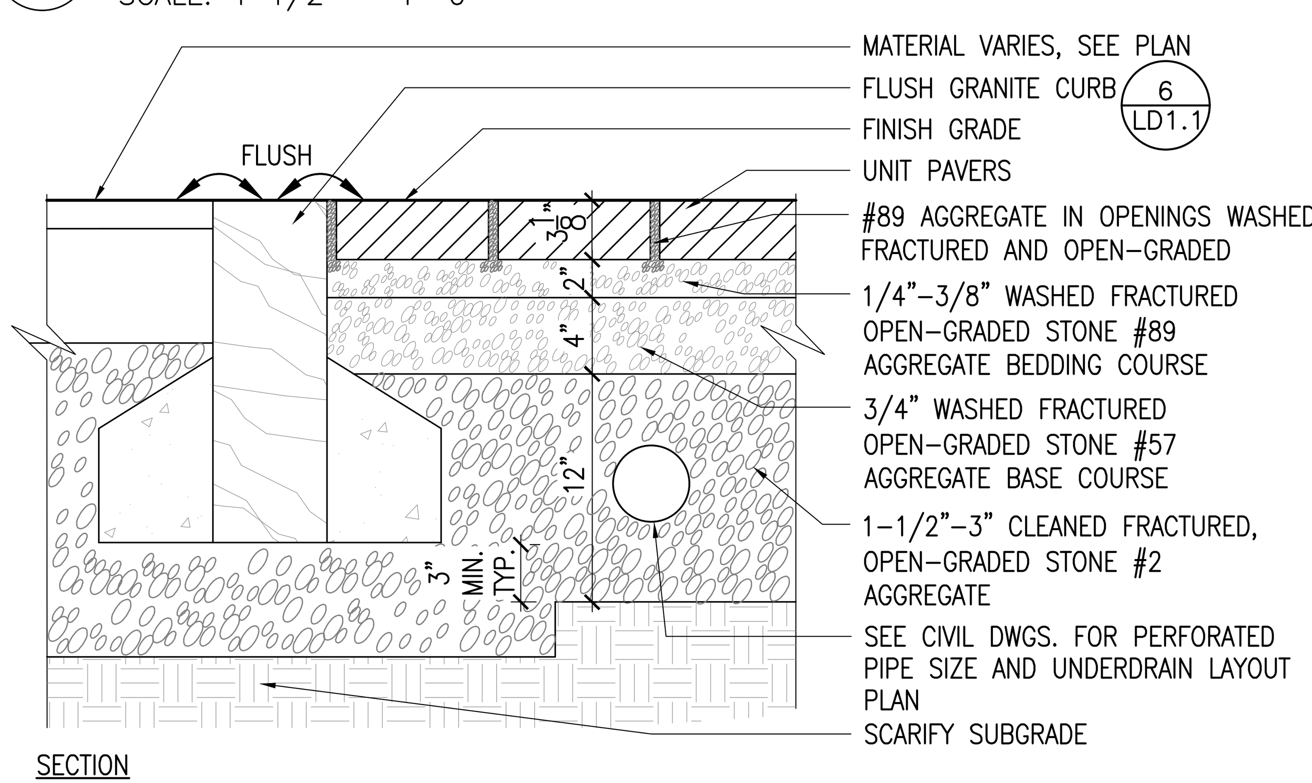




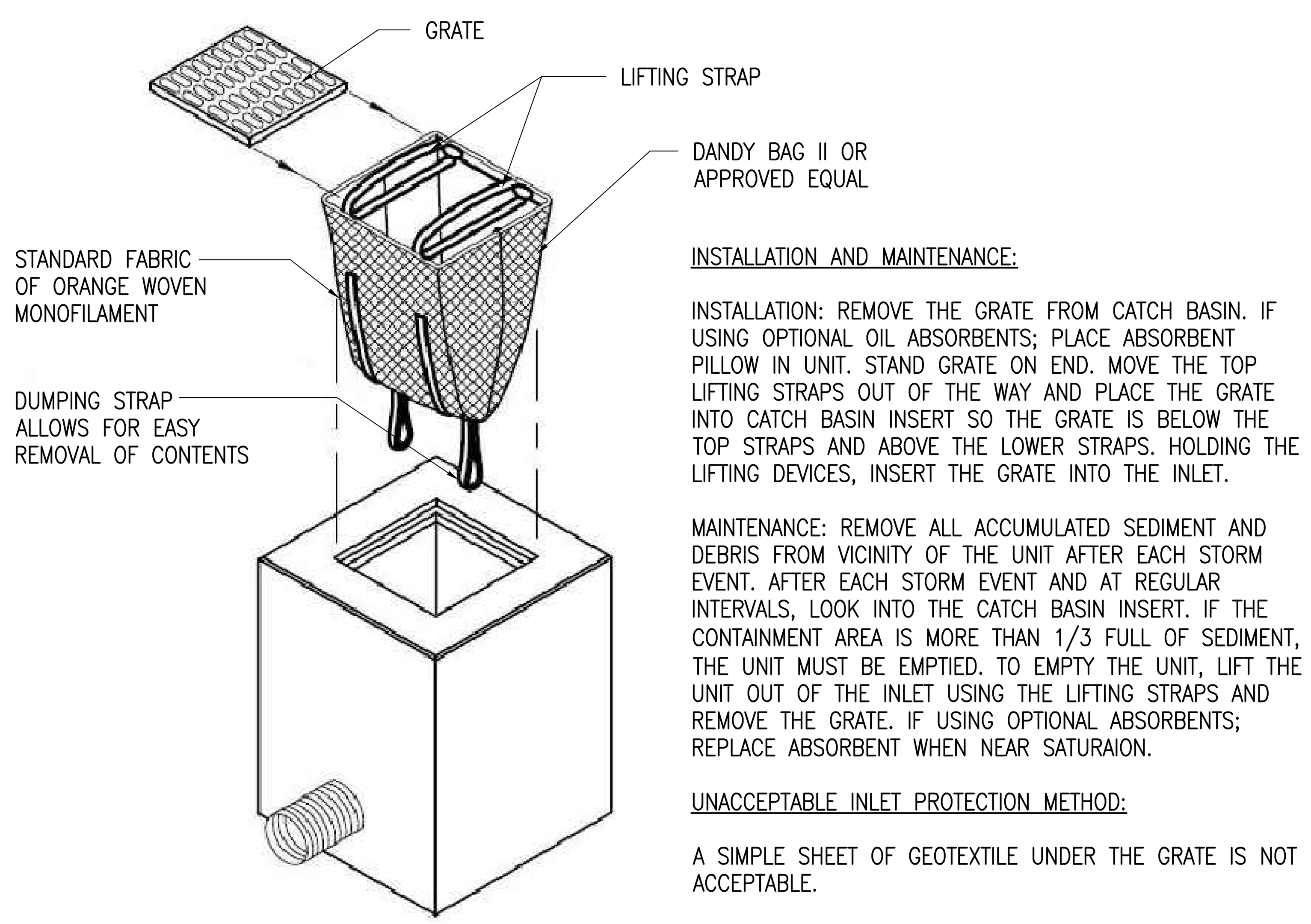
INSTALLATION NOTES FOR ALL JOINTS:
1. EXPANSION JOINTS 20'-0" O.C. UNLESS SHOWN OTHERWISE
2. CONTROL JOINTS 5'-0" O.C. UNLESS SHOWN OTHERWISE
3. SAWCUT EDGES AND JOINTS, ALL PANELS.

NOTE:
DOWEL IS TYPICAL AT ALL EJ'S EXCEPT AGAINST VERTICAL JOINTS WITH WALLS, CURBS, OR SITE IMPROVEMENTS

5 CONCRETE PAVEMENT
SCALE: 1 1/2" = 1'-0"



12 PERMEABLE CONCRETE UNIT PAVER
SCALE: 1 1/2" = 1'-0"



INSTALLATION AND MAINTENANCE:

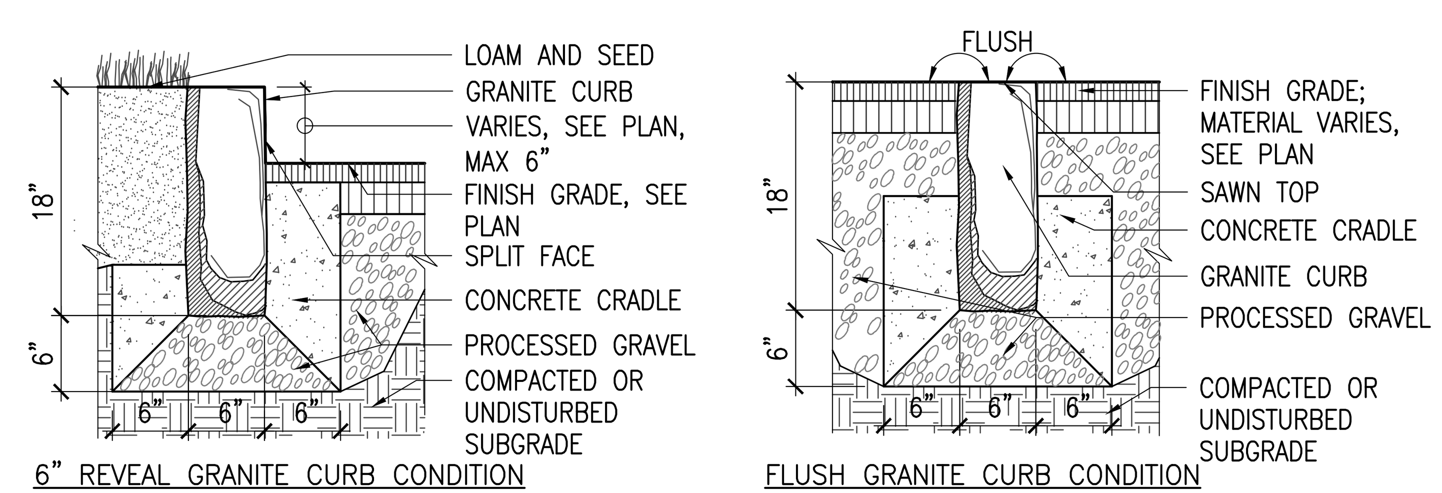
INSTALLATION: REMOVE THE GRATE FROM CATCH BASIN. IF USING OPTIONAL OIL ABSORBENTS; PLACE ABSORBENT PILLOW IN UNIT. STAND GRATE ON END. MOVE THE TOP LIFTING STRAPS OUT OF THE WAY AND PLACE THE GRATE INTO CATCH BASIN INSERT SO THE GRATE IS BELOW THE TOP STRAPS AND ABOVE THE LOWER STRAPS. HOLDING THE LIFTING DEVICES, INSERT THE GRATE INTO THE INLET.

MAINTENANCE: REMOVE ALL ACCUMULATED SEDIMENT AND DEBRIS FROM VICINITY OF THE UNIT AFTER EACH STORM EVENT. AFTER EACH STORM EVENT AND AT REGULAR INTERVALS, LOOK INTO THE CATCH BASIN INSERT. IF THE CONTAINMENT AREA IS MORE THAN 1/3 FULL OF SEDIMENT, THE UNIT MUST BE EMPTIED. TO EMPTY THE UNIT, LIFT THE UNIT OUT OF THE INLET USING THE LIFTING STRAPS AND REMOVE THE GRATE. IF USING OPTIONAL ABSORBENTS; REPLACE ABSORBENT WHEN NEAR SATURAION.

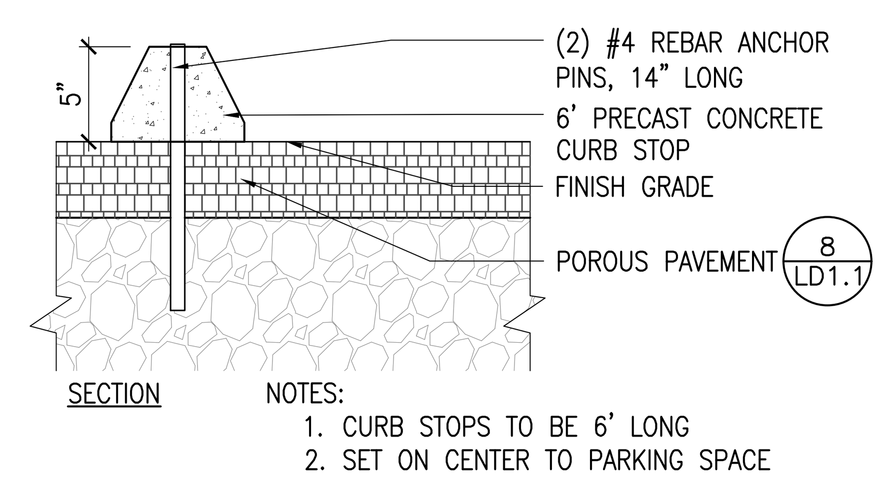
UNACCEPTABLE INLET PROTECTION METHOD:

A SIMPLE SHEET OF GEOTEXTILE UNDER THE GRATE IS NOT ACCEPTABLE.

3 SILT SACK
SCALE: N.T.S.



6 GRANITE CURB
SCALE: 1" = 1'-0"



NOTES:
1. CURB STOPS TO BE 6' LONG
2. SET ON CENTER TO PARKING SPACE

13 CONCRETE CURB STOP
SCALE: 1 1/2" = 1'-0"

ARLINGTON RESERVOIR - PHASE 2

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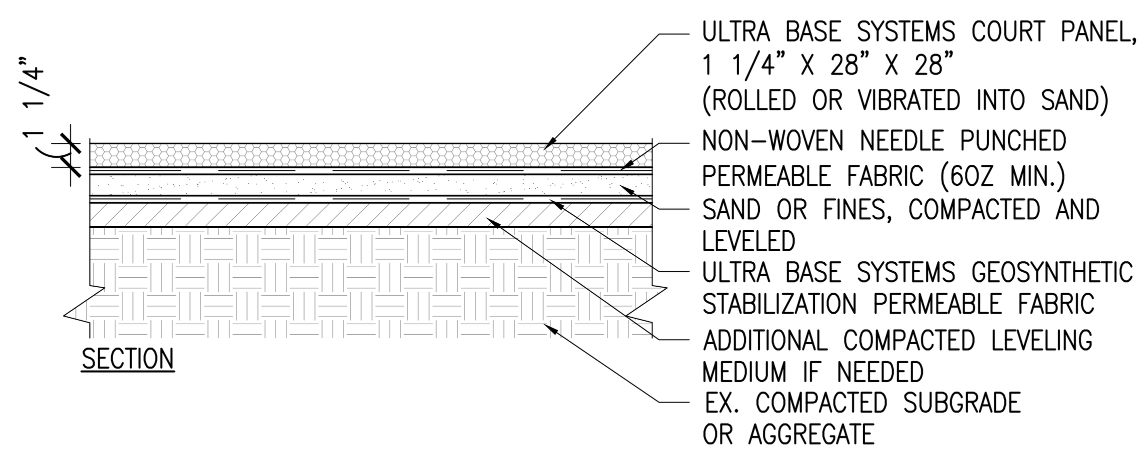
Drawing Title:

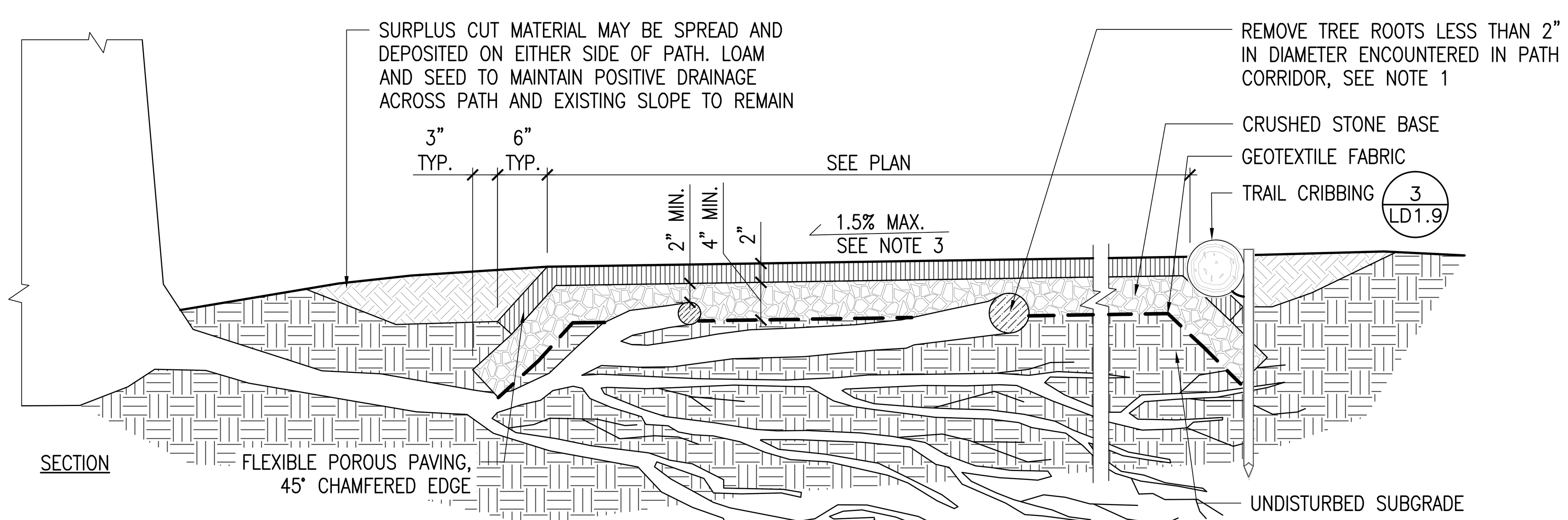
DETAILS

LD1.1



1 PERMEABLE ATHLETIC COURT SURFACING

SCALE: 1 1/2" = 1'-0"

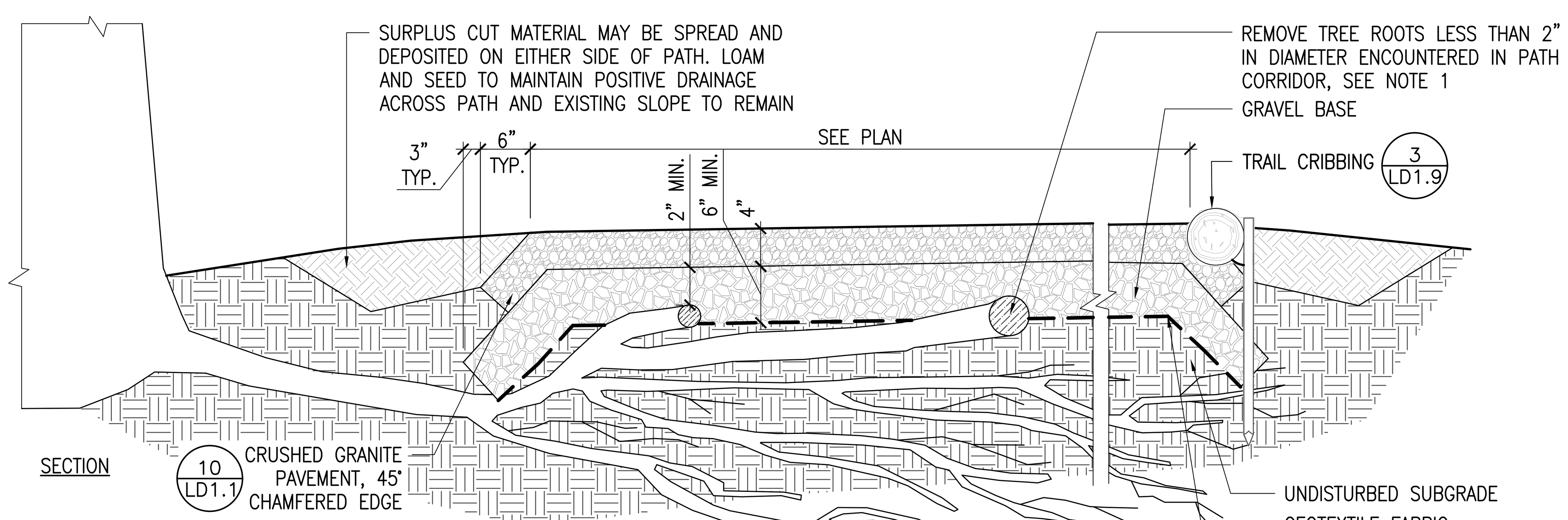


NOTE:

1. TO PREVENT INJURY TO CRITICAL ROOT ZONES OF ADJACENT TREES, SOIL IS TO BE EXCAVATED NON-INVASIVELY A MINIMUM OF 6 INCHES USING SUPERSONIC AIR KNIFE. FABRIC AND STONE ARE TO BE INSTALLED OVER AND AROUND ROOTS. SUBGRADE SHALL BE COMPACTED TO THE GREATEST EXTENT POSSIBLE. ROOT PRUNING MAY BE PERFORMED BY ARBORIST AS NEEDED ON SELECTED ROOTS LESS THAN 2 INCHES IN DIAMETER PROVIDED NO MORE THAN 15% OF THE CRITICAL ROOT ZONE IS REMOVED.
2. WHEREVER POSSIBLE, AND WITHOUT INJURING CRITICAL ROOT ZONES OF ADJACENT TREES. CRUSHED STONE BASE SHALL RUN 6 INCHES BEYOND THE END OF THE FLEXIBLE POROUS PAVING. AT LEAST 2" OF STONE SHALL COVER THE TOP OF ROOTS BEFORE FLEXIBLE POROUS MATERIAL IS LAID.
3. WALKWAY SHALL MAINTAIN A CROSS PITCH OF NOT MORE THAN ONE AND A HALF (1.5%) PERCENT. ANY DISCREPANCY NOT ALLOWING THIS TO OCCUR SHALL BE REPORTED TO LANDSCAPE ARCHITECT PRIOR TO CONTINUING WORK.

2 RUBBER SURFACING - TRAIL (ADD ALTERNATE)

SCALE: 1" = 1'-0"



NOTE:

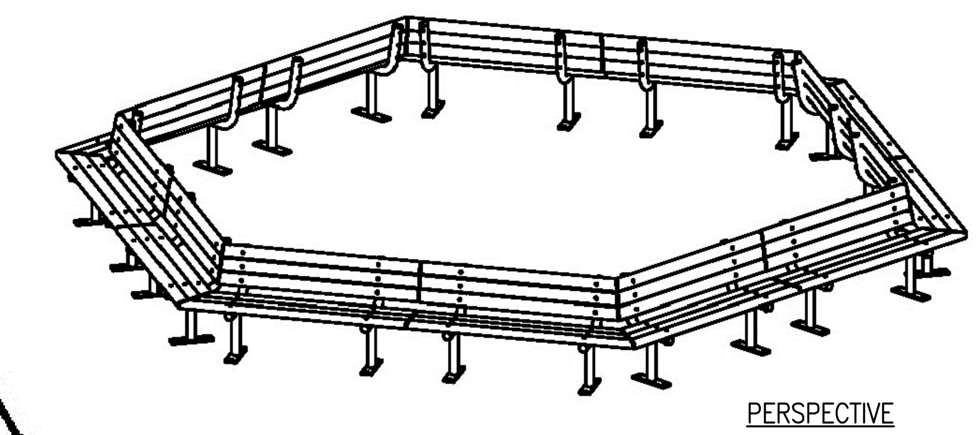
1. TO PREVENT INJURY TO CRITICAL ROOT ZONES OF ADJACENT TREES, SOIL IS TO BE EXCAVATED NON-INVASIVELY A MINIMUM OF 6 INCHES USING SUPERSONIC AIR KNIFE. FABRIC AND STONE ARE TO BE INSTALLED OVER AND AROUND ROOTS. SUBGRADE SHALL BE COMPACTED TO THE GREATEST EXTENT POSSIBLE. ROOT PRUNING MAY BE PERFORMED BY ARBORIST AS NEEDED ON SELECTED ROOTS LESS THAN 2 INCHES IN DIAMETER PROVIDED NO MORE THAN 15% OF THE CRITICAL ROOT ZONE IS REMOVED.
2. WHEREVER POSSIBLE, AND WITHOUT INJURING CRITICAL ROOT ZONES OF ADJACENT TREES. CRUSHED STONE BASE SHALL RUN 6 INCHES BEYOND THE END OF THE STONEDUST PAVING. AT LEAST 2" OF STONE SHALL COVER THE TOP OF ROOTS BEFORE STONEDUST IS LAID.
3. WALKWAY SHALL MAINTAIN A CROSS PITCH OF NOT MORE THAN ONE AND A HALF (1.5%) PERCENT. ANY DISCREPANCY NOT ALLOWING THIS TO OCCUR SHALL BE REPORTED TO LANDSCAPE ARCHITECT PRIOR TO CONTINUING WORK.

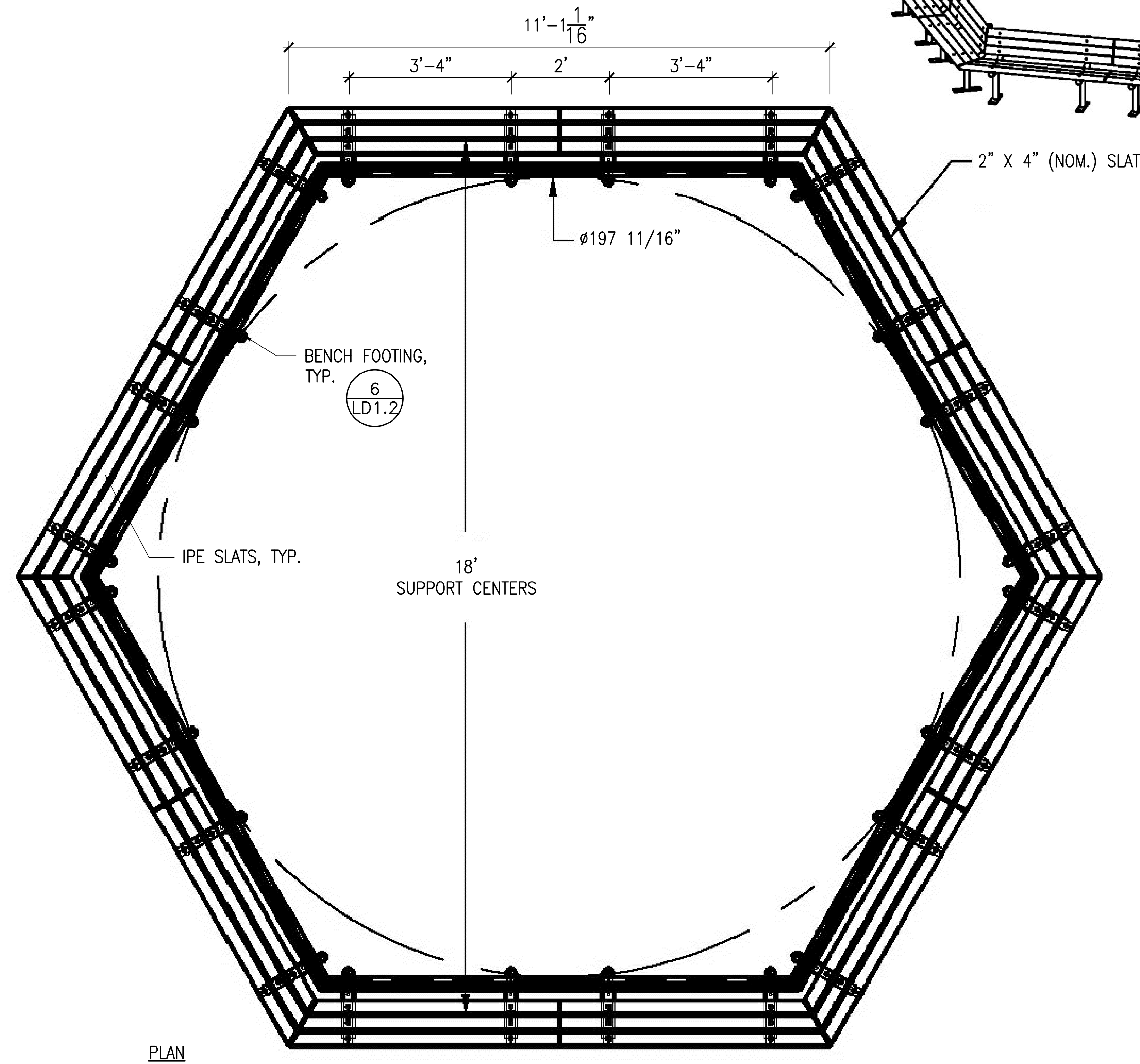
3 STABILIZED CRUSHED GRANITE PAVEMENT OVER TREE ROOTS

SCALE: 1" = 1'-0"

NOTE:

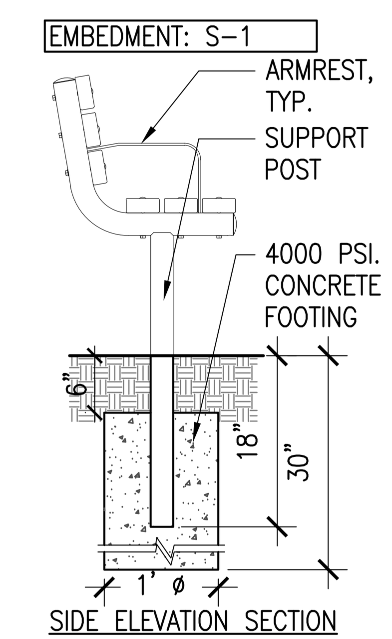
1. ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.
2. SEE SPECS. FOR COLOR INFO.
3. ALL BENCHES TO HAVE ARMRESTS.
4. ALL BENCHES TO HAVE IPE SLATS.





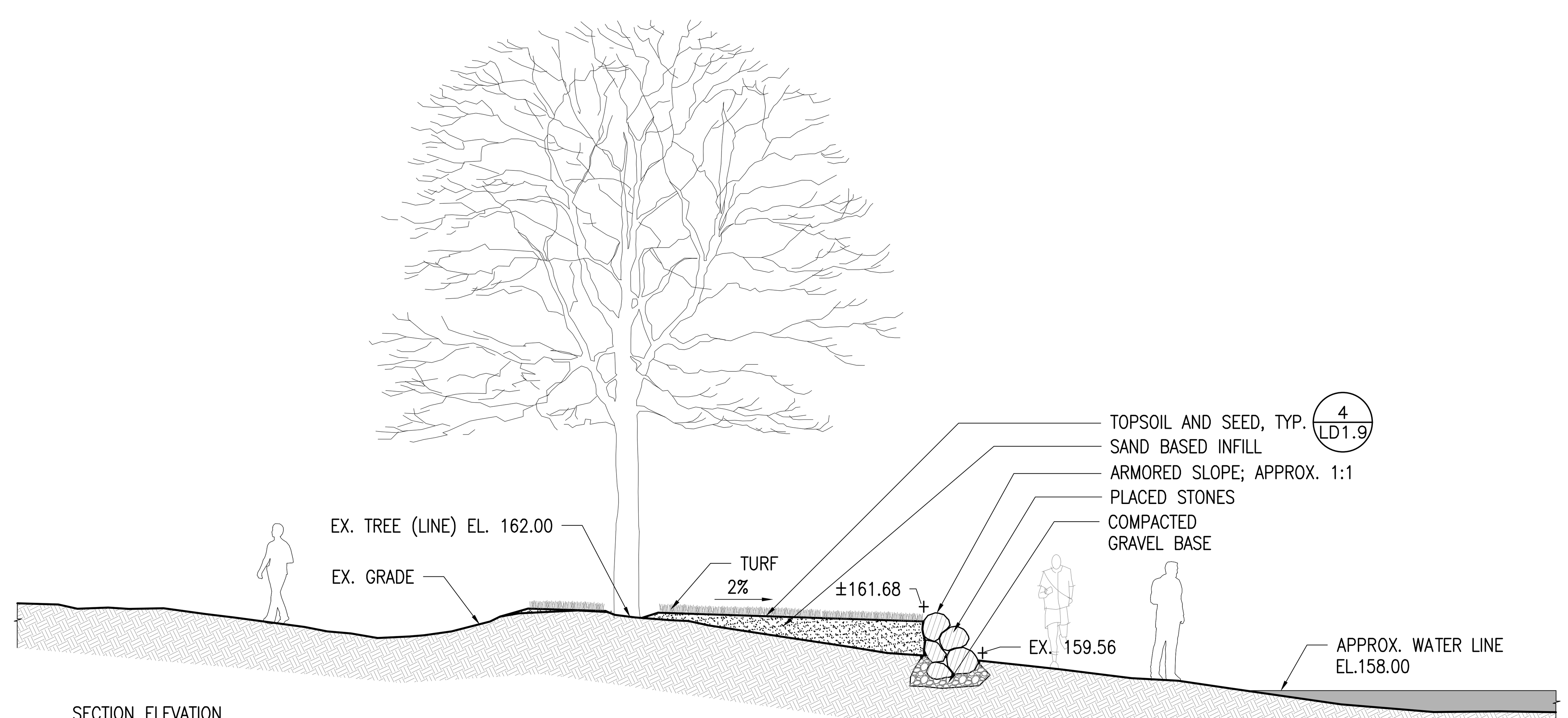
4 HEXAGONAL BENCH

SCALE: 1/2" = 1'-0"



6 BENCH FOOTING

SCALE: 3/4" = 1'-0"



5 ARMORED SLOPE AT BEACH

SCALE: 3/16" = 1'-0"

ARLINGTON RESERVOIR - PHASE 2

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Boston, MA 02108
617 451-1018 Tel
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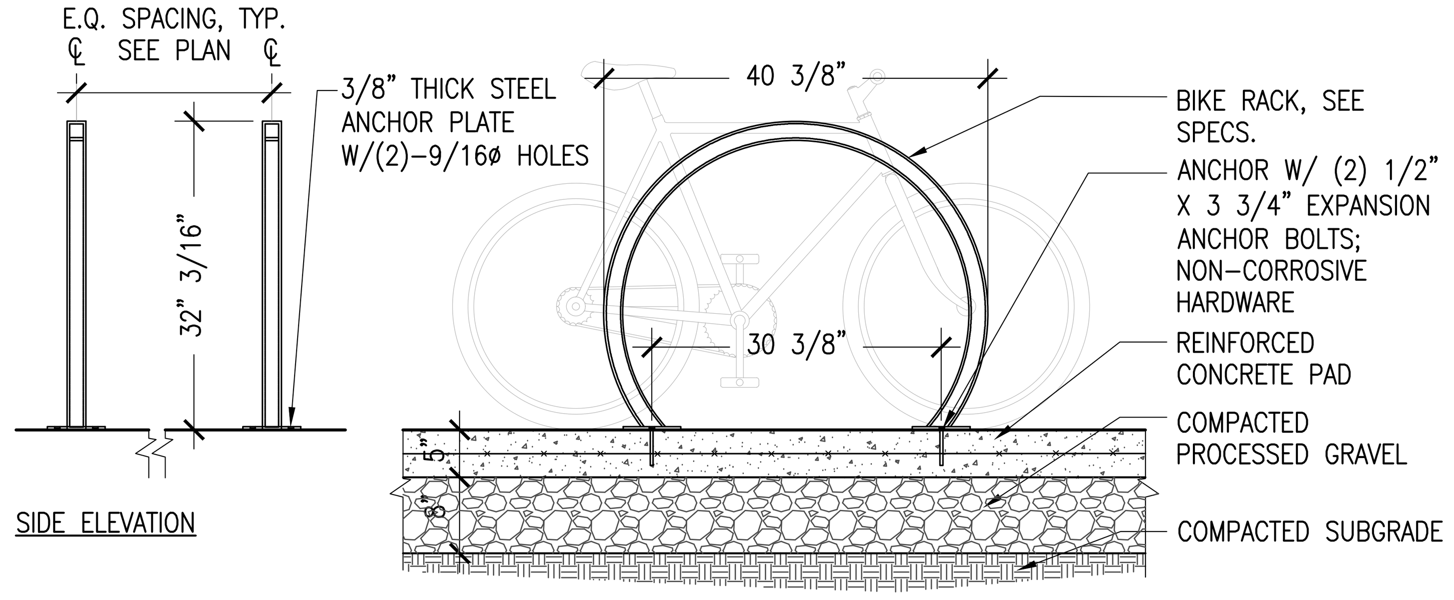
100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: AS SHOWN
Drawing Title:

DETAILS

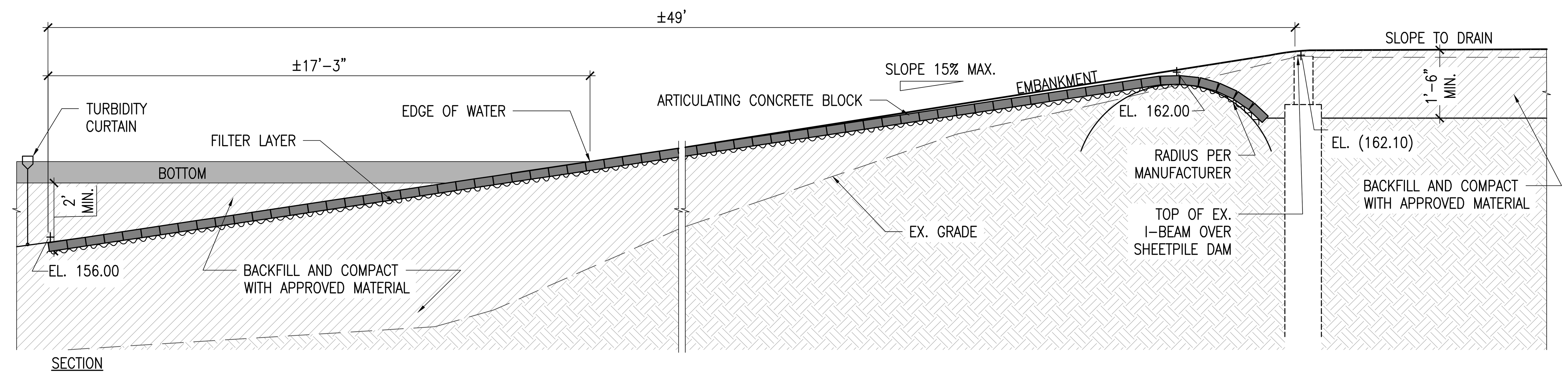
LD1.2



NOTE:
1. ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.
2. SEE SPECS. FOR COLOR INFO.

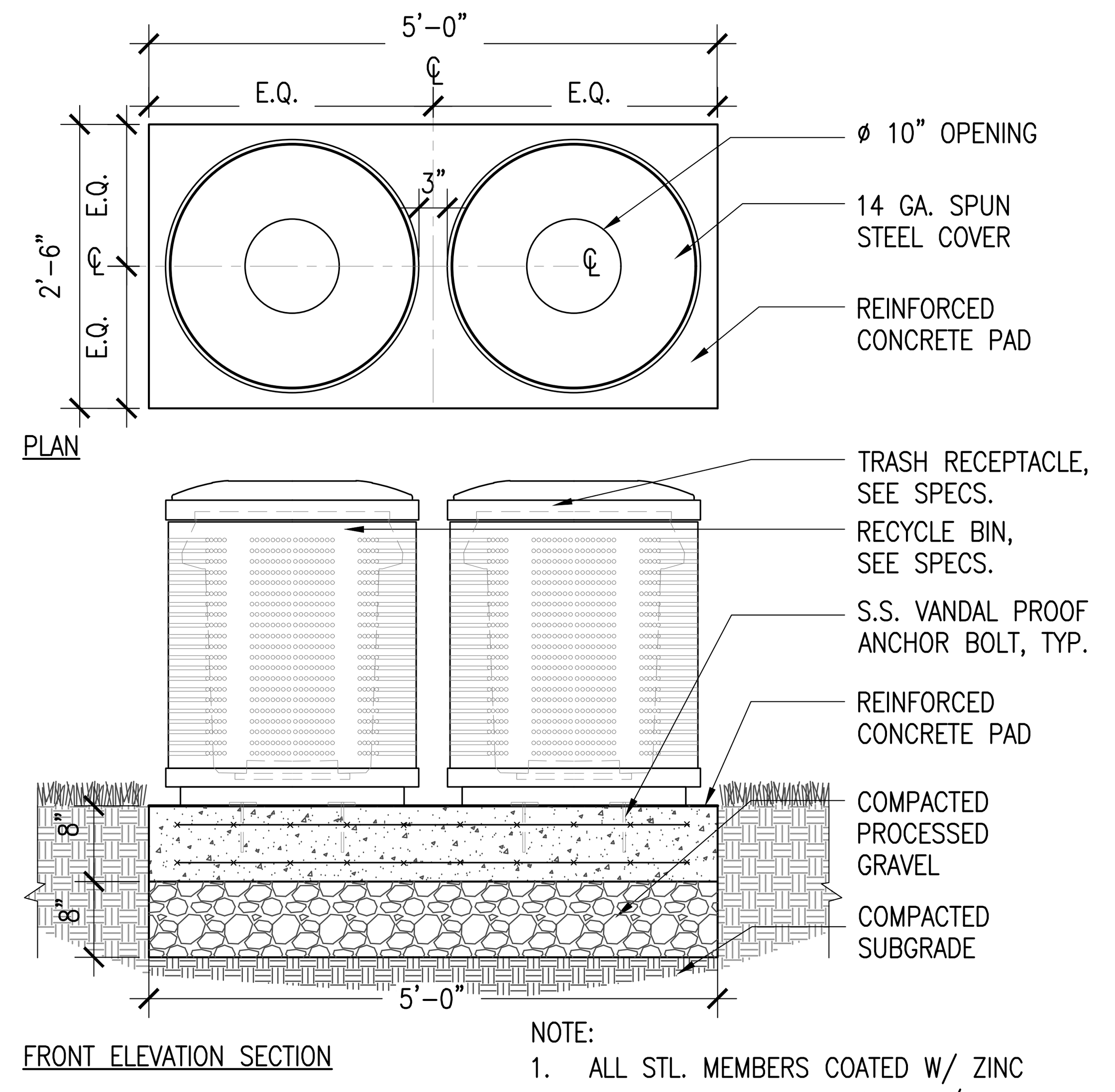
1 BIKE RACK

SCALE: 3/4" = 1'-0"



4 BOAT RAMP CONCRETE

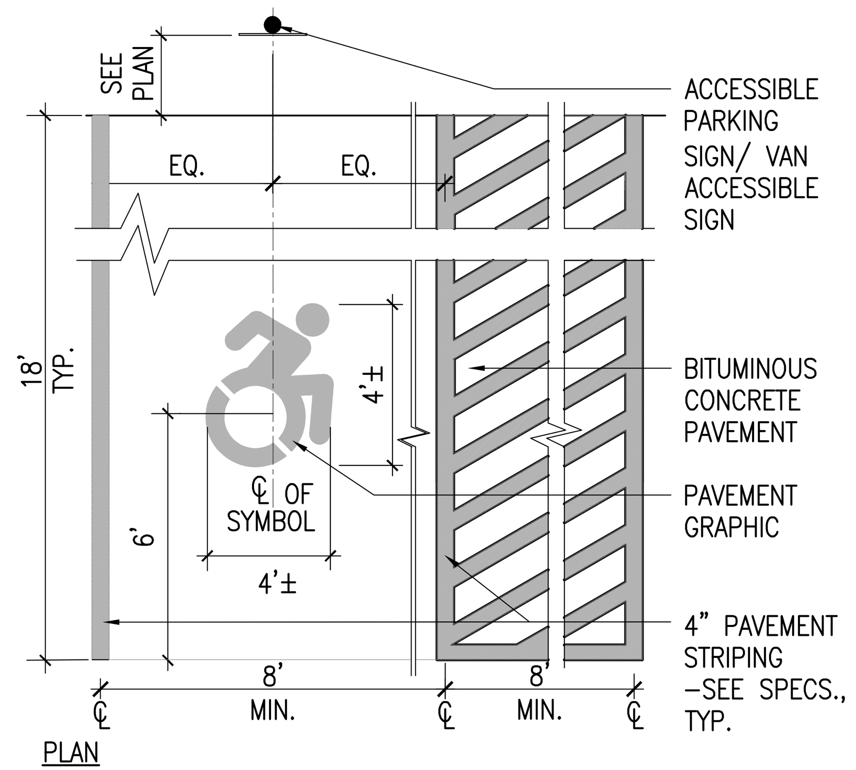
SCALE: 3/8" = 1'-0"



NOTE:
1. ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.
2. SEE SPECS. FOR COLOR INFO.

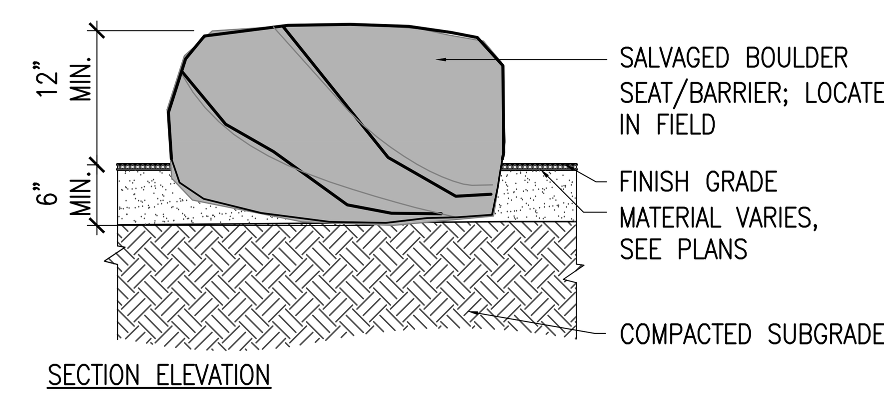
2 TRASH RECEPTACLE AND RECYCLING BIN

SCALE: 3/4" = 1'-0"



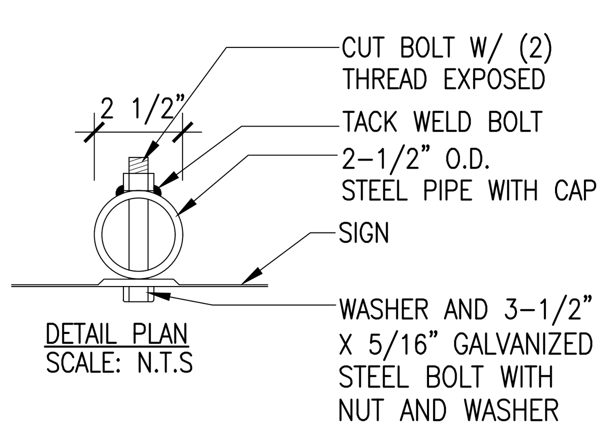
5 PAVEMENT MARKING - ACCESSIBILITY

SCALE: N.T.S.



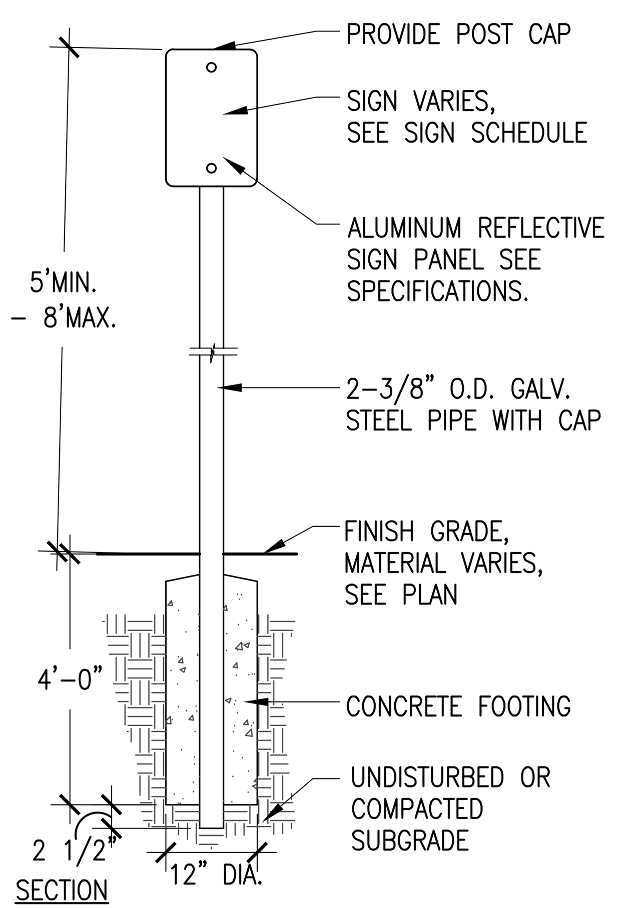
7 PLACED BOULDER

SCALE: 3/4" = 1'-0"



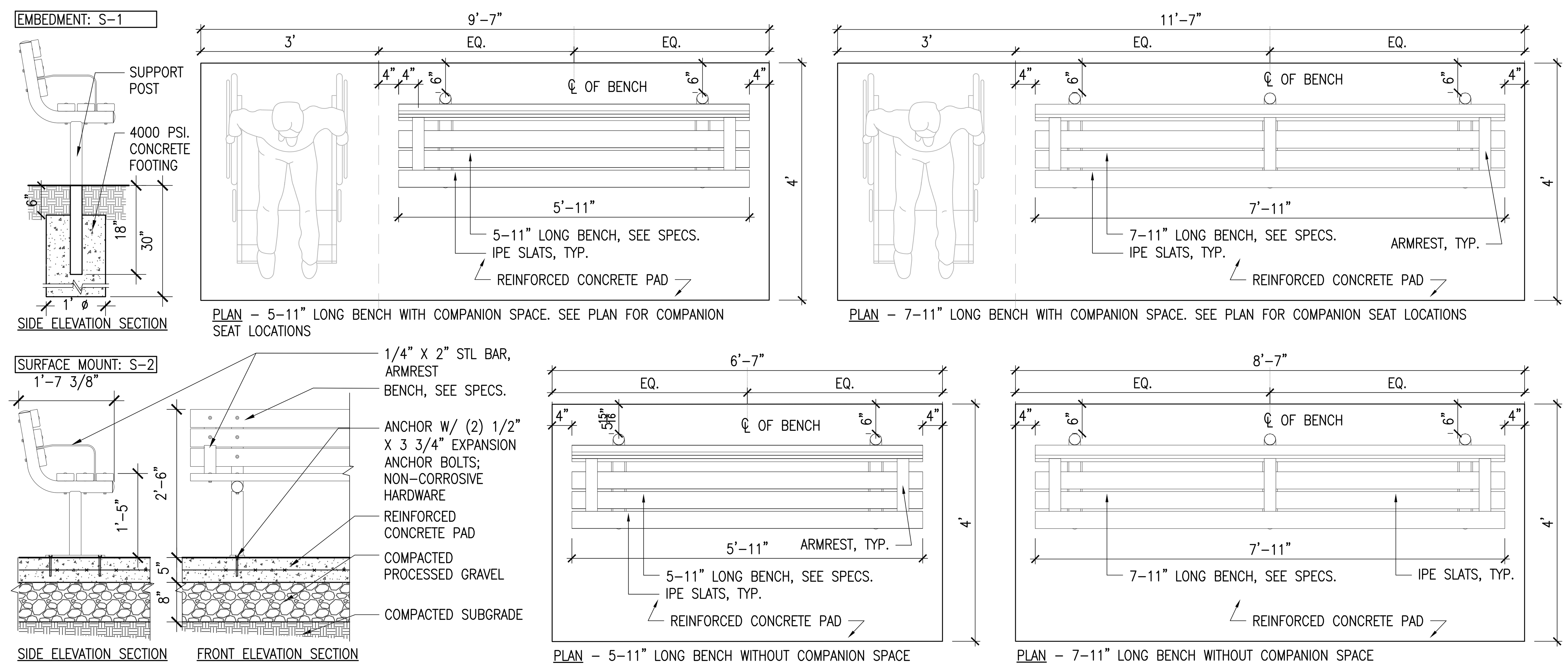
SIGNAGE SCHEDULE

MESSAGE	CODE	SIGN
ACCESSIBLE PARKING SIGN	R7-8	
VAN ACCESSIBLE PARKING SIGN	R7-8A	



3 ACCESSIBLE PARKING SIGN

SCALE: 3/4" = 1'-0"



NOTE:
1. ALL STL. MEMBERS COATED W/ ZINC RICH EPOXY THEN FINISHED W/ POLYESTER POWDER COATING.
2. SEE SPECS. FOR COLOR INFO.
3. ALL BENCHES TO HAVE ARMRESTS.
4. ALL BENCHES TO HAVE IPE SLATS.
5. CONCRETE PAD SHALL HAVE 2% MAX SLOPE IN ALL DIRECTIONS.

6 BENCH

SCALE: 3/4" = 1'-0"

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

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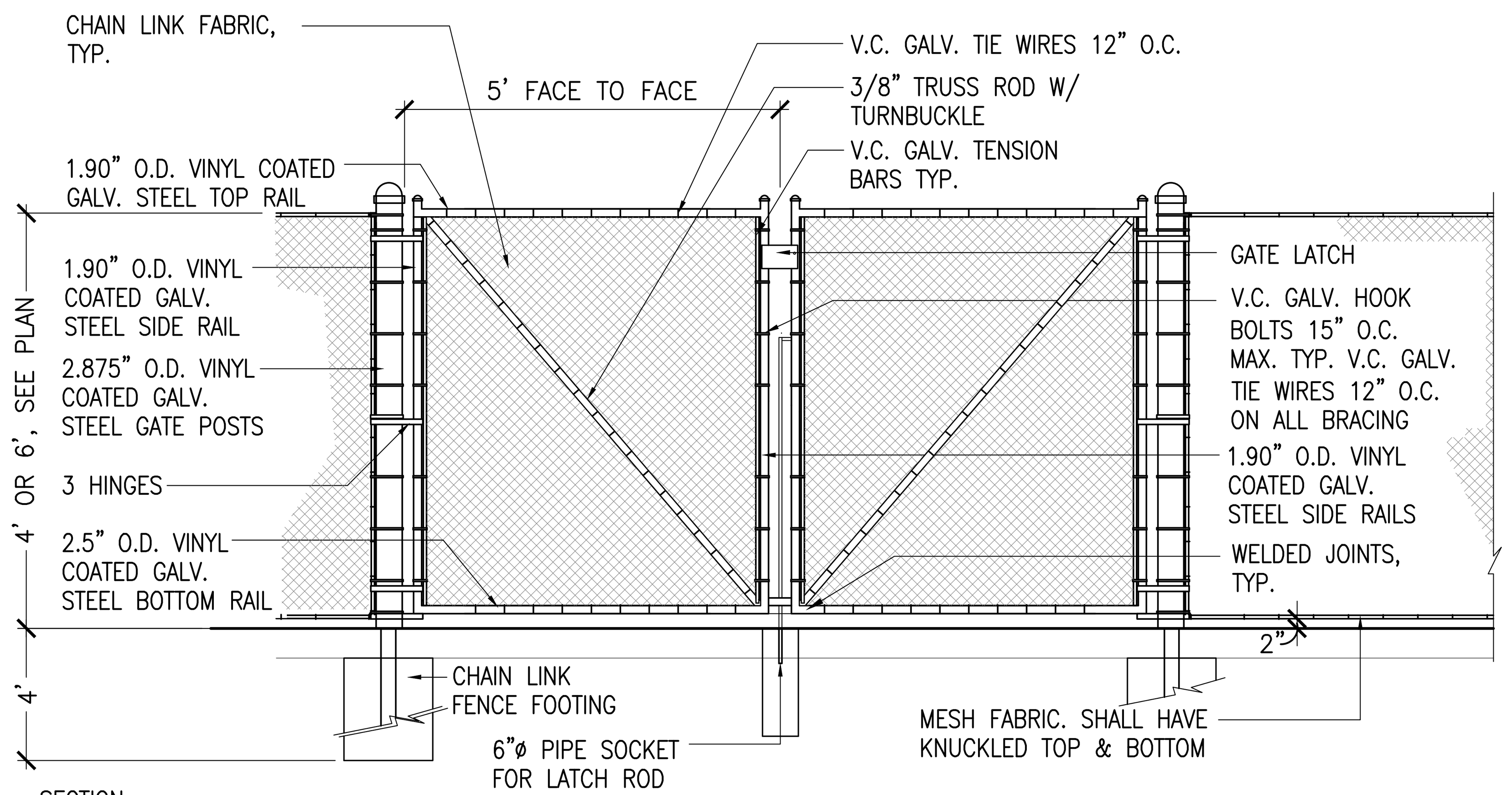
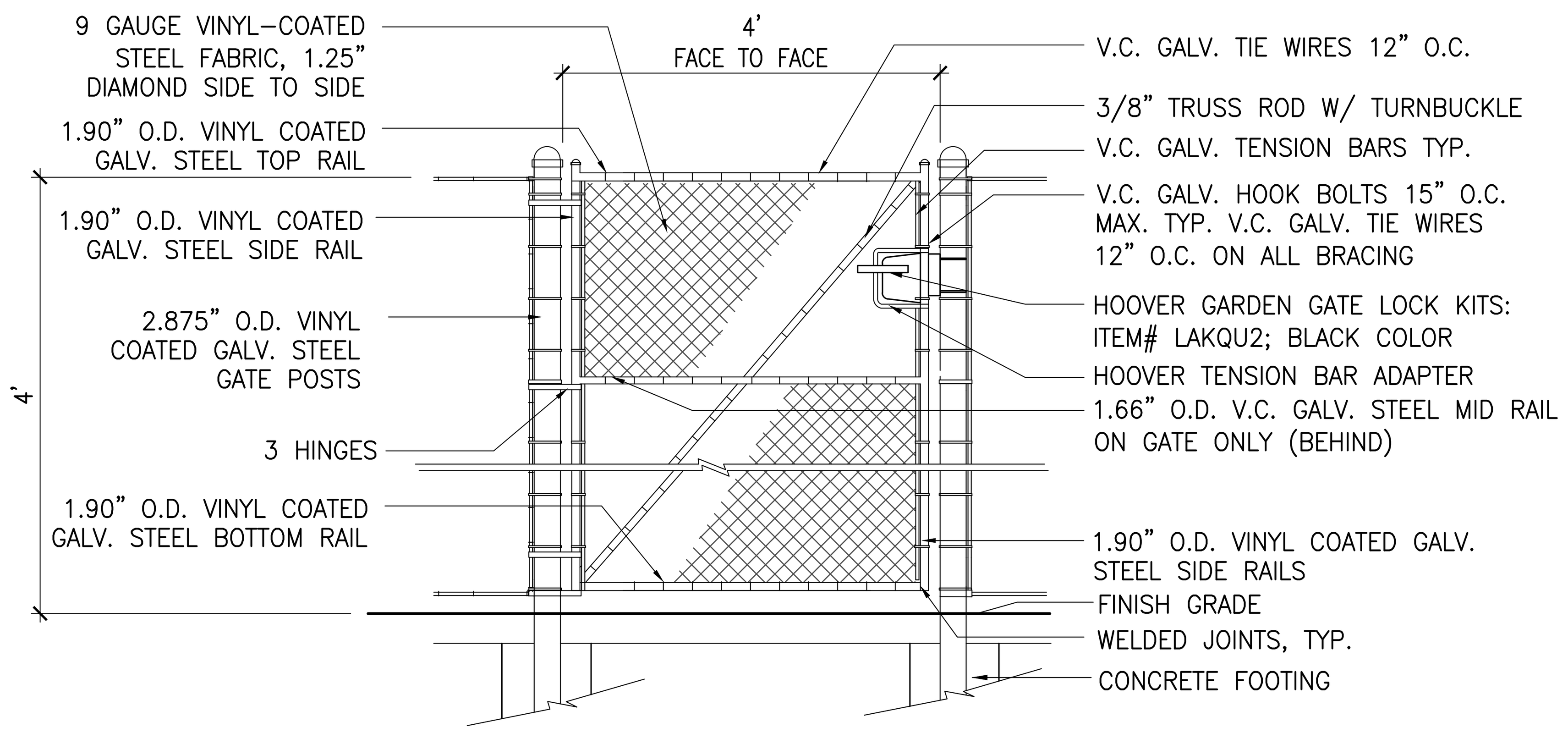
LD1.3



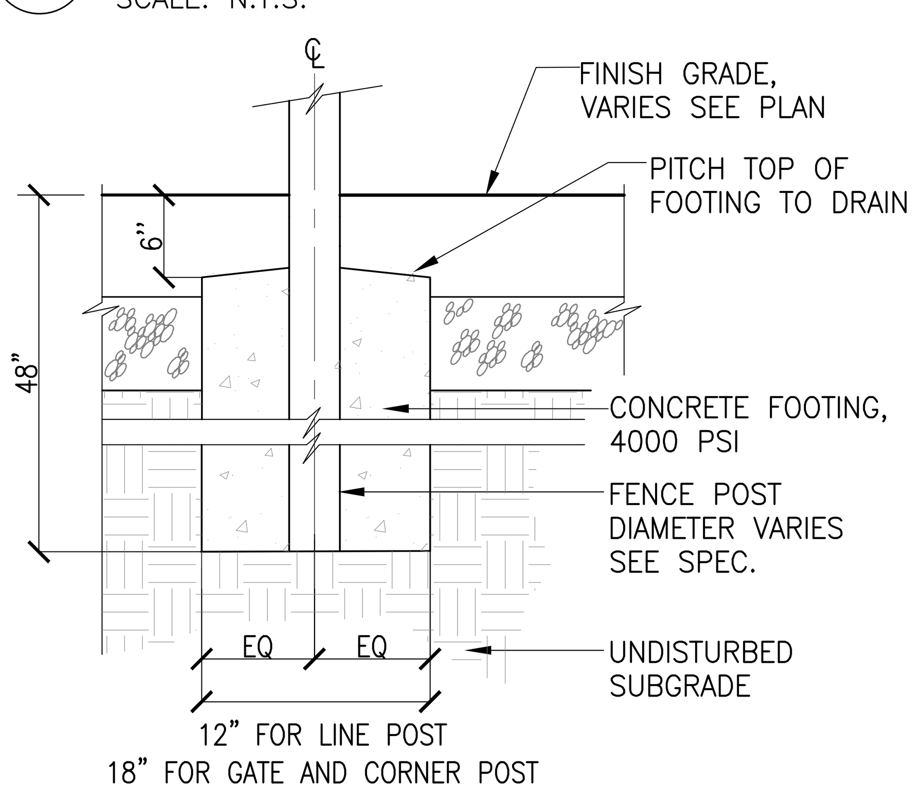
1 DOUBLE CHAIN LINK FENCE GATE

SCALE: N.T.S.



2 SINGLE CHAIN LINK GATE

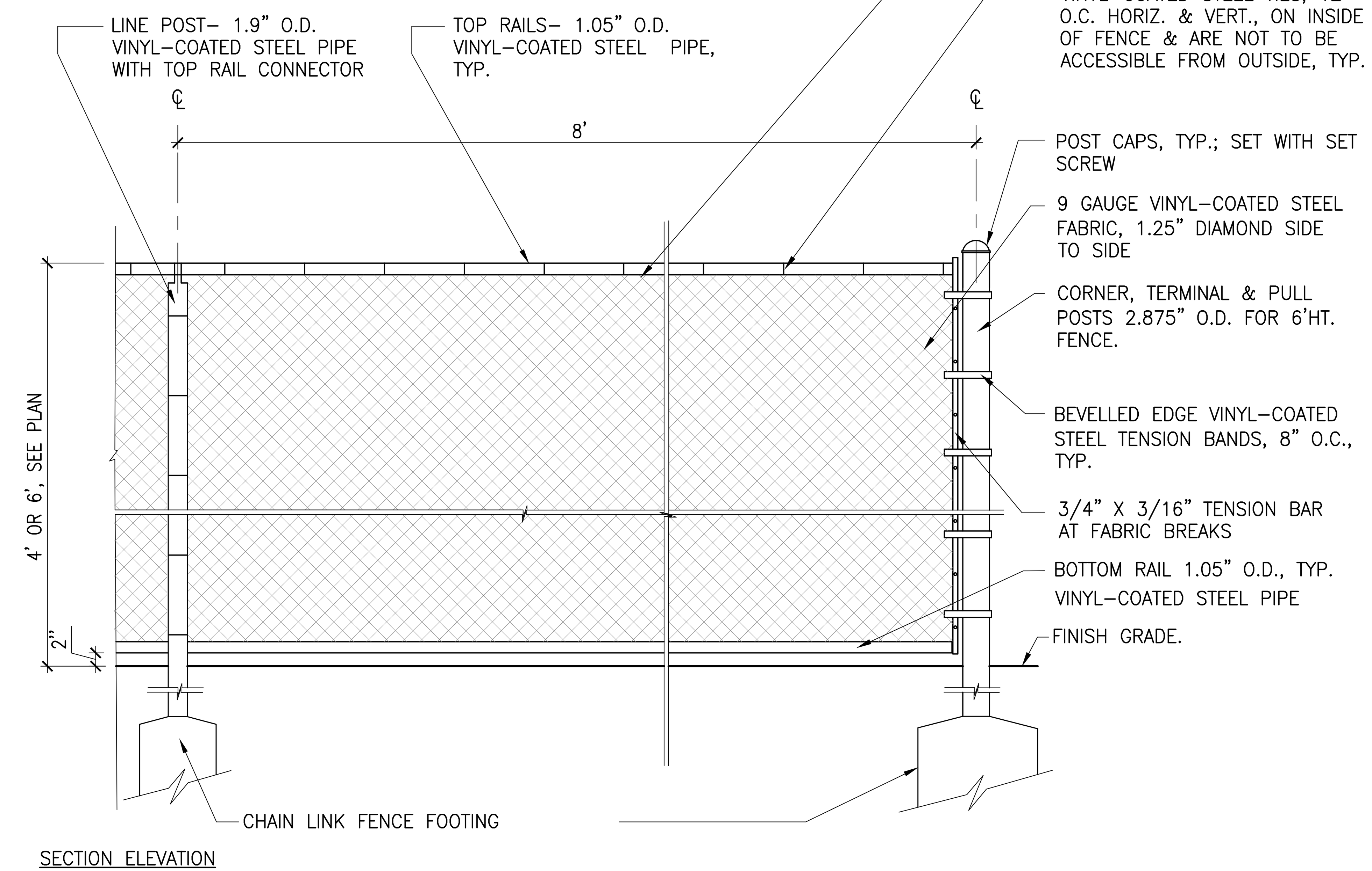
SCALE: N.T.S.



3 CHAIN LINK FENCE FOOTING

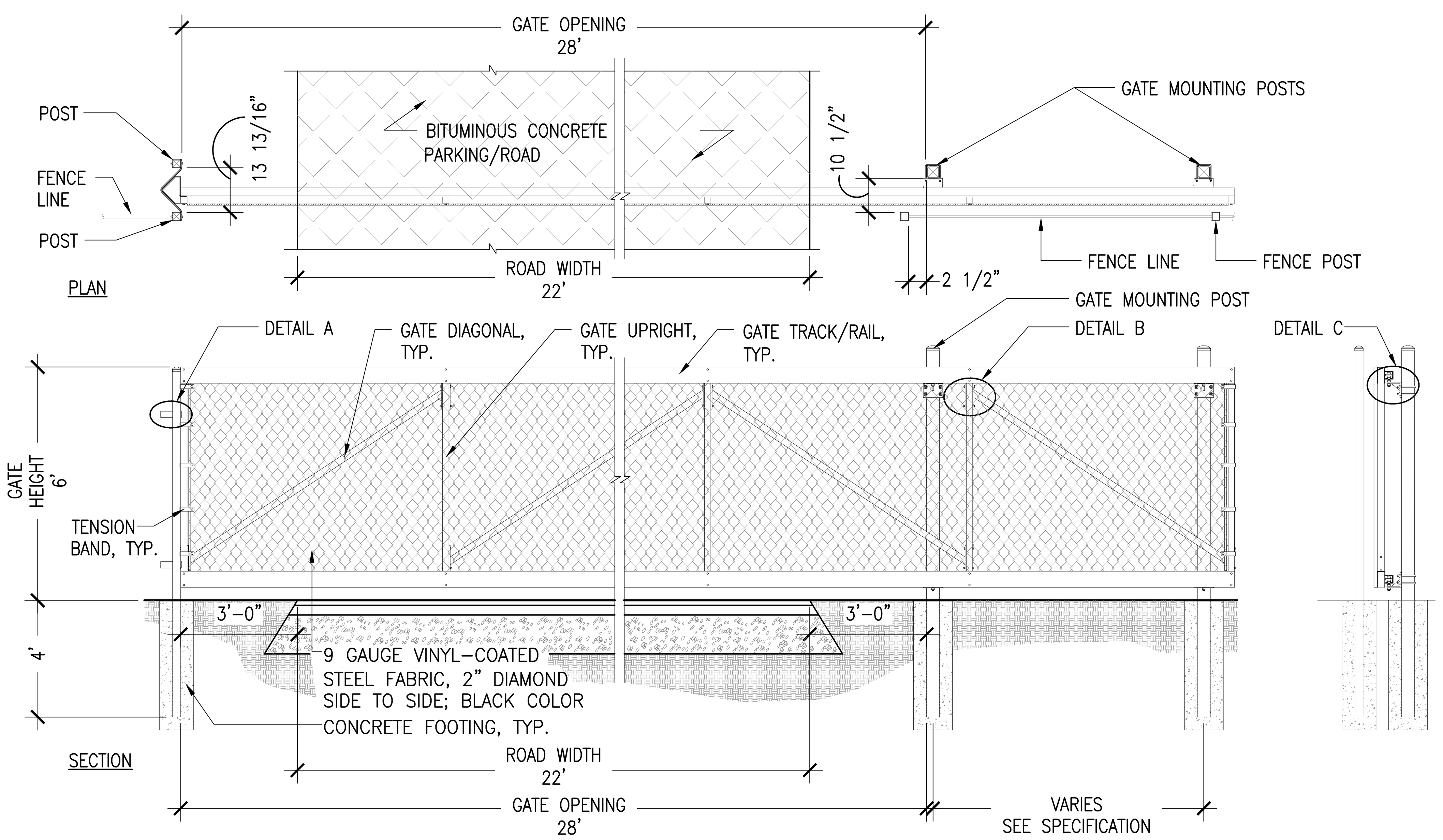
SCALE: 1" = 1'-0"

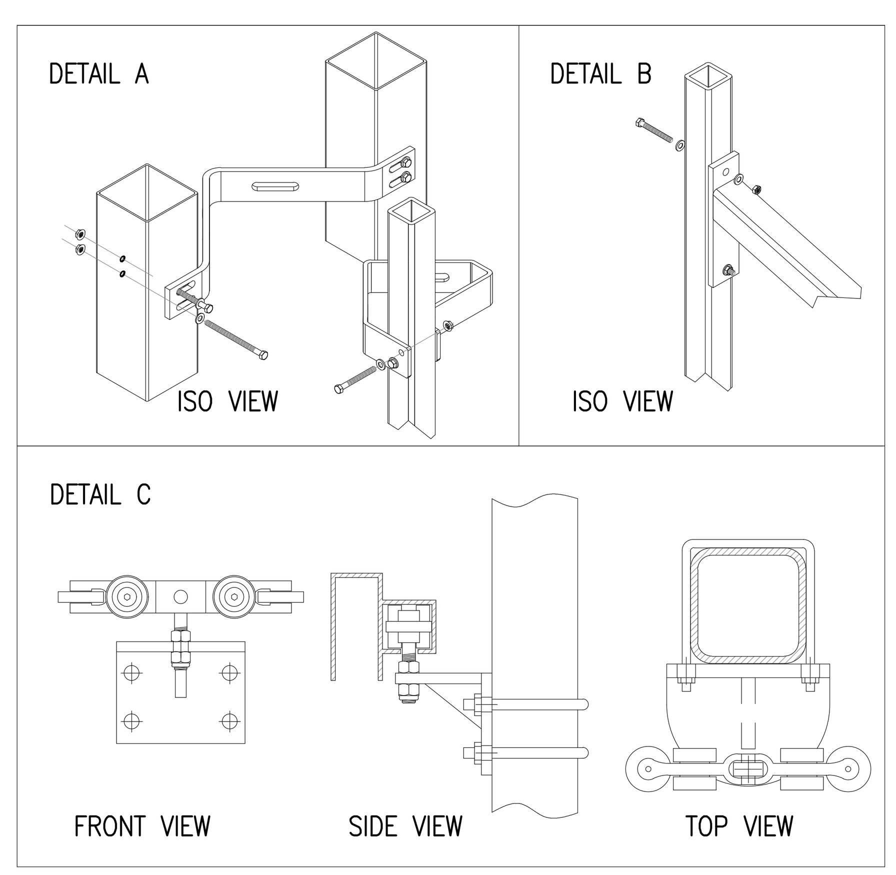
NOTES:
1) TOPS & BOTTOMS OF ALL FABRIC TO BE KNUCKLED DOWN.
2) ALL FENCE FABRIC SHALL BE VINYL-COATED GALVANIZED STEEL. ALL POSTS AND HARDWARE TO BE VINYL-COATED GALVANIZED STEEL.
3) VINYL COATING COLOR SHALL BE BLACK.



4 CHAIN LINK FENCE

SCALE: N.T.S.





NOTE:
1. VALUES SHOWN ARE NOMINAL AND NOT TO BE USED FOR INSTALLATION PURPOSES. SEE PRODUCT SPECIFICATION FOR INSTALLATION REQUIREMENTS.
2. ALL FENCE FABRIC SHALL BE BLACK VINYL-COATED GALVANIZED STEEL.
3. ALL POSTS AND HARDWARE TO BE BLACK VINYL-COATED GALVANIZED STEEL.

5 CHAIN LINK FENCE CANTILEVER GATE

SCALE: N.T.S.

ARLINGTON RESERVOIR - PHASE 2

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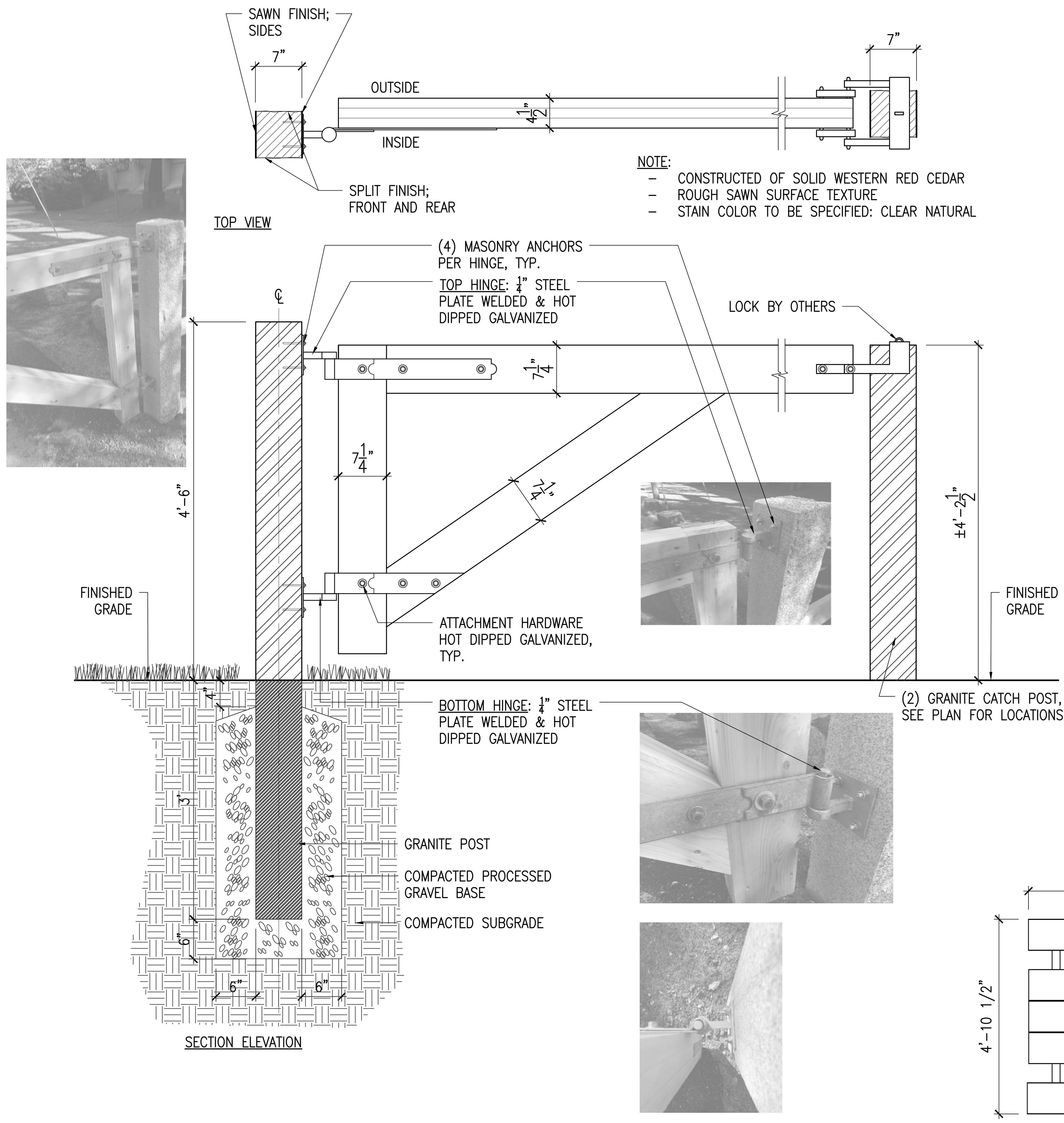
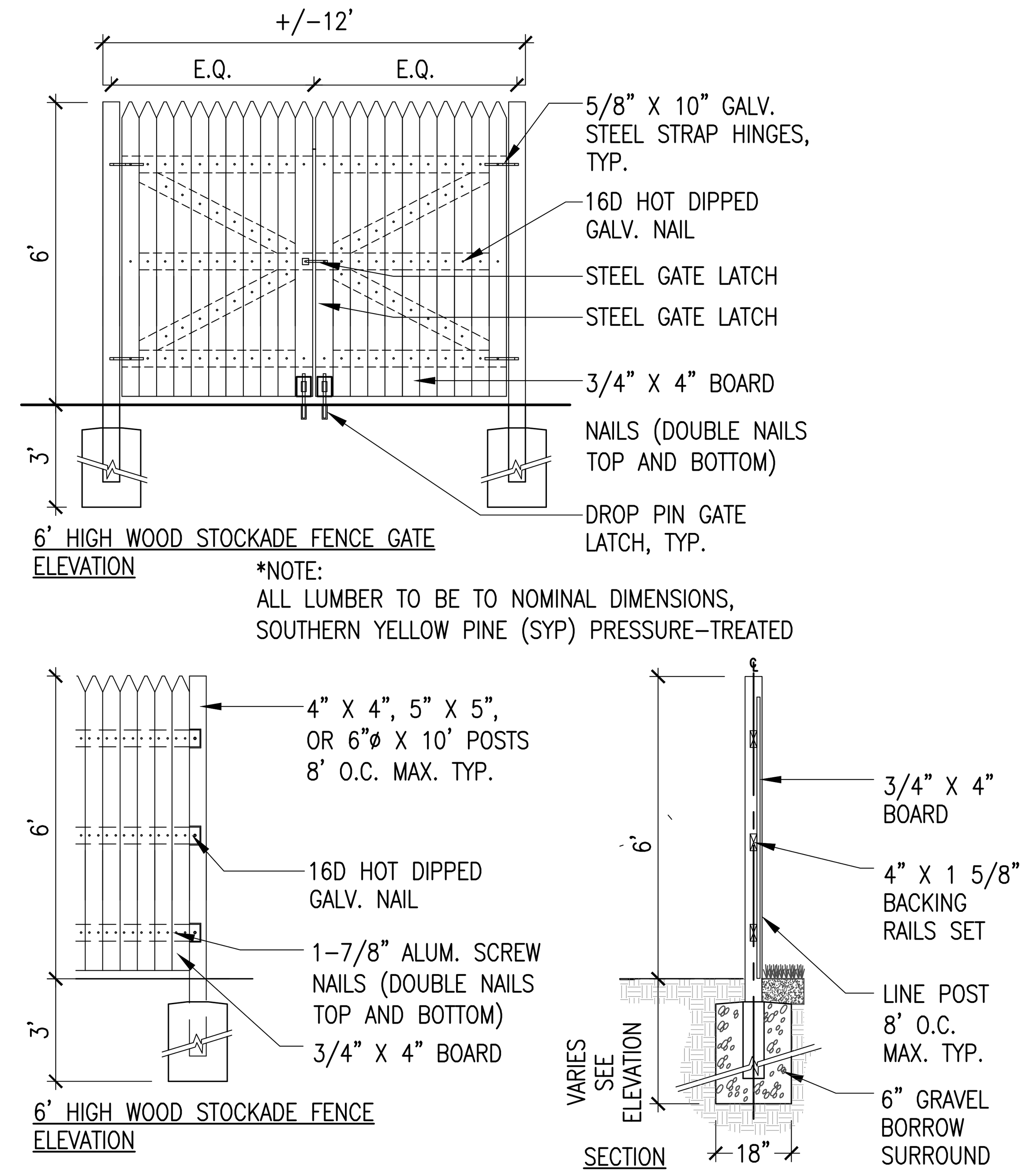
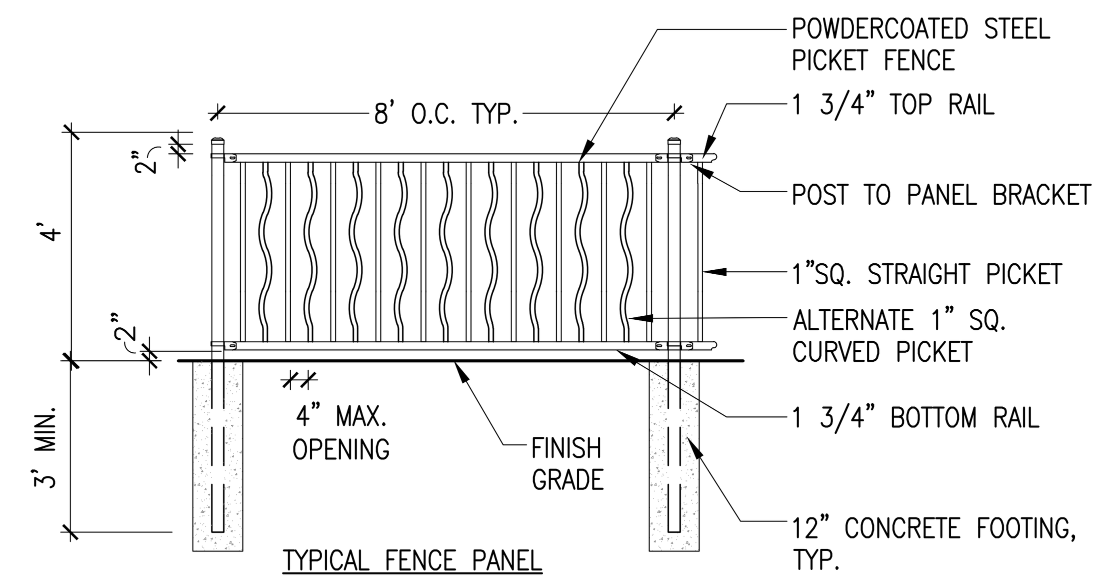
LD1.4



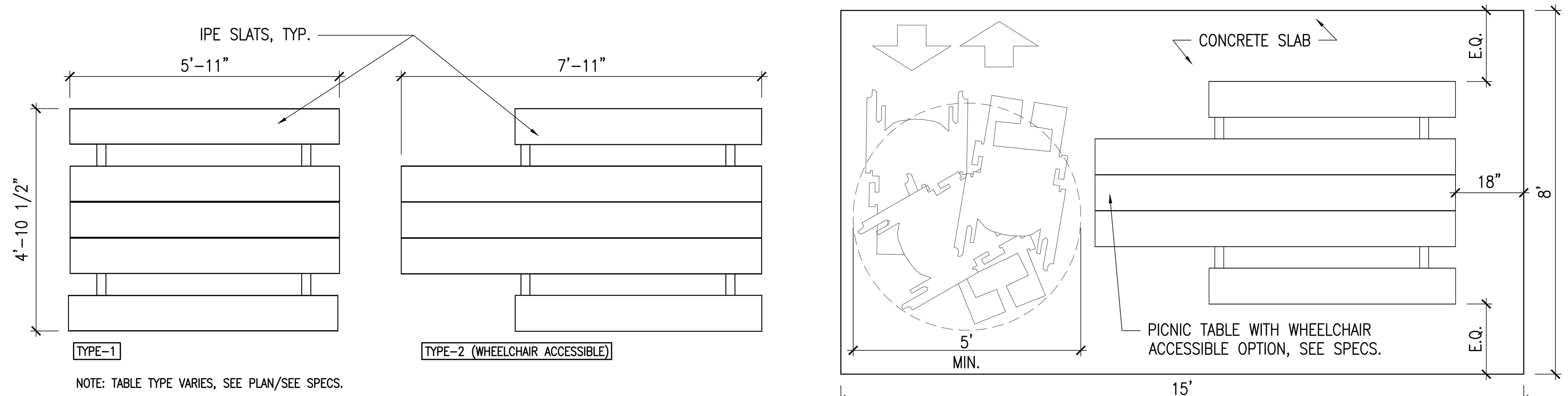
1 WOODEN GATE W/ GRANITE POST
SCALE: 1" = 1'-0"



3 UTILITY FENCE
SCALE: N.T.S.

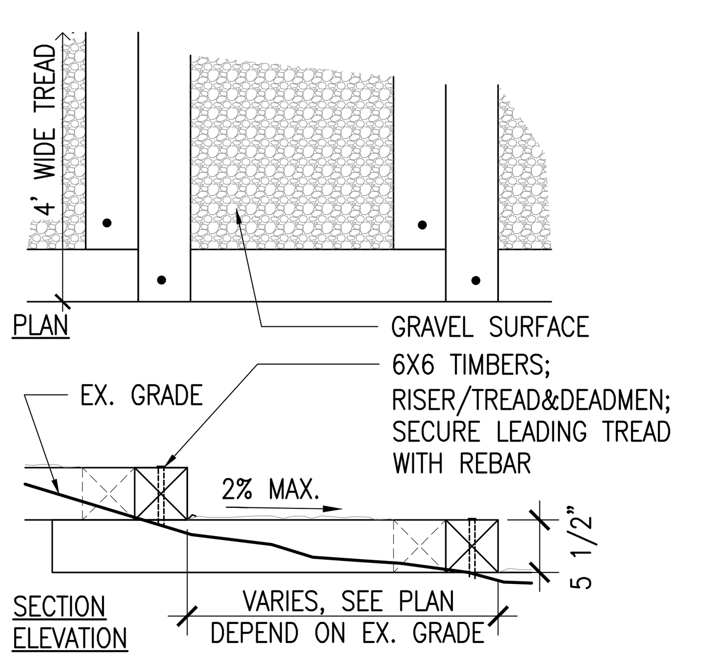


5 ORNAMENTAL FENCE- ADD ALT
SCALE: 3/8" = 1'-0"



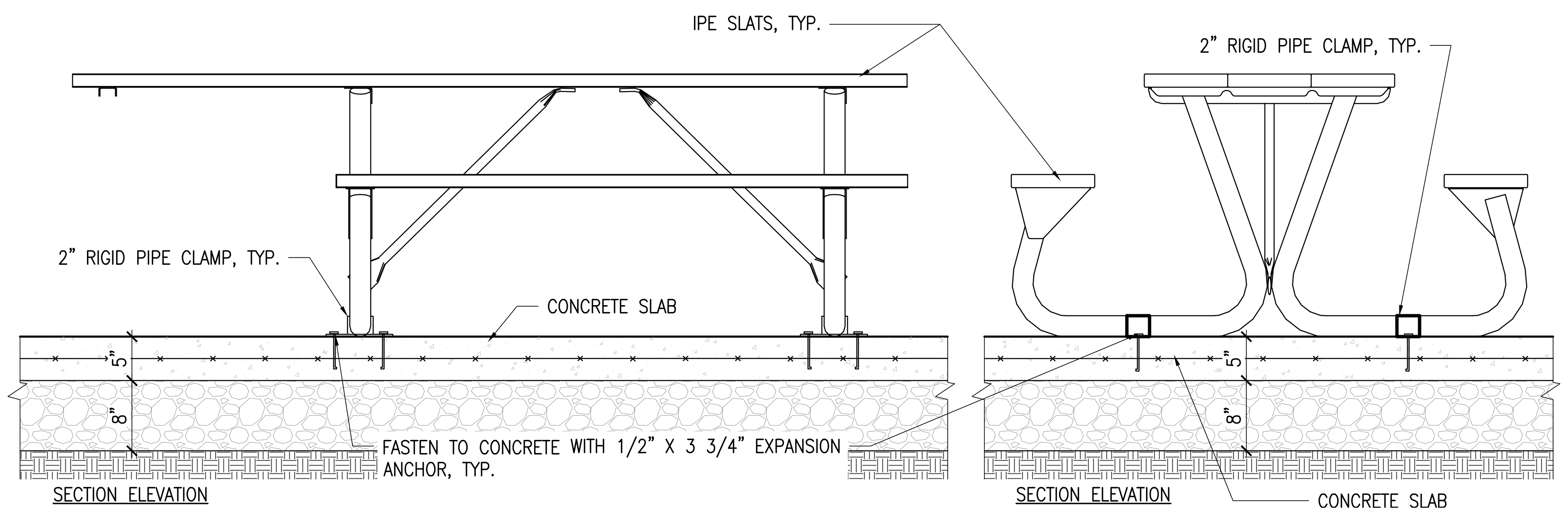
PLAN
SCALE: 1/2"=1'-0"

LAYOUT PLAN
SCALE: 1/2"=1'-0"



NOTE:
1. LUMBER TO BE TREATED WITH LOW TOXICITY WOOD PRESERVATIVE
2. GRAVEL COLOR TO BE APPROVED BY LANDSCAPE ARCHITECT
3. TREAD LAYER TO BE FIRM AND STABLE CRUSHED STONE MIX
4. BASE LAYER TO BE FREE–DRAINING CRUSHED STONE
5. RISERS SHALL BE CONSISTENT THROUGHOUT STAIR RUN
6. ANCHORING TO SUBGRADE TO BE DESIGNED BY CONTRACTOR, AS NECESSARY

2 TIMBER CRIB STEP
SCALE: 3/4" = 1'-0"



4 PICNIC TABLE ON CONCRETE PAD
SCALE: 1" = 1'-0"

ARLINGTON RESERVOIR - PHASE 2

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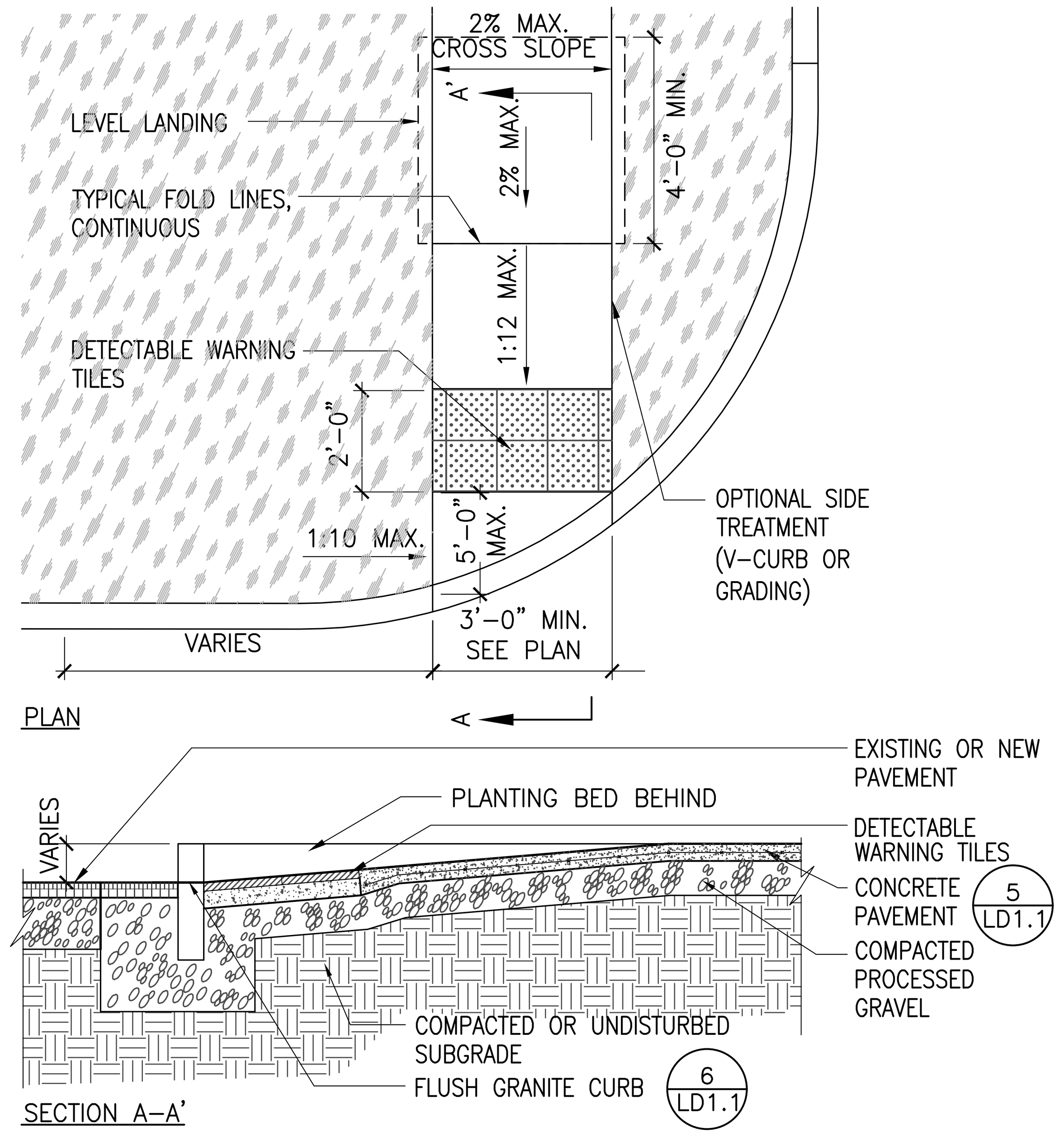
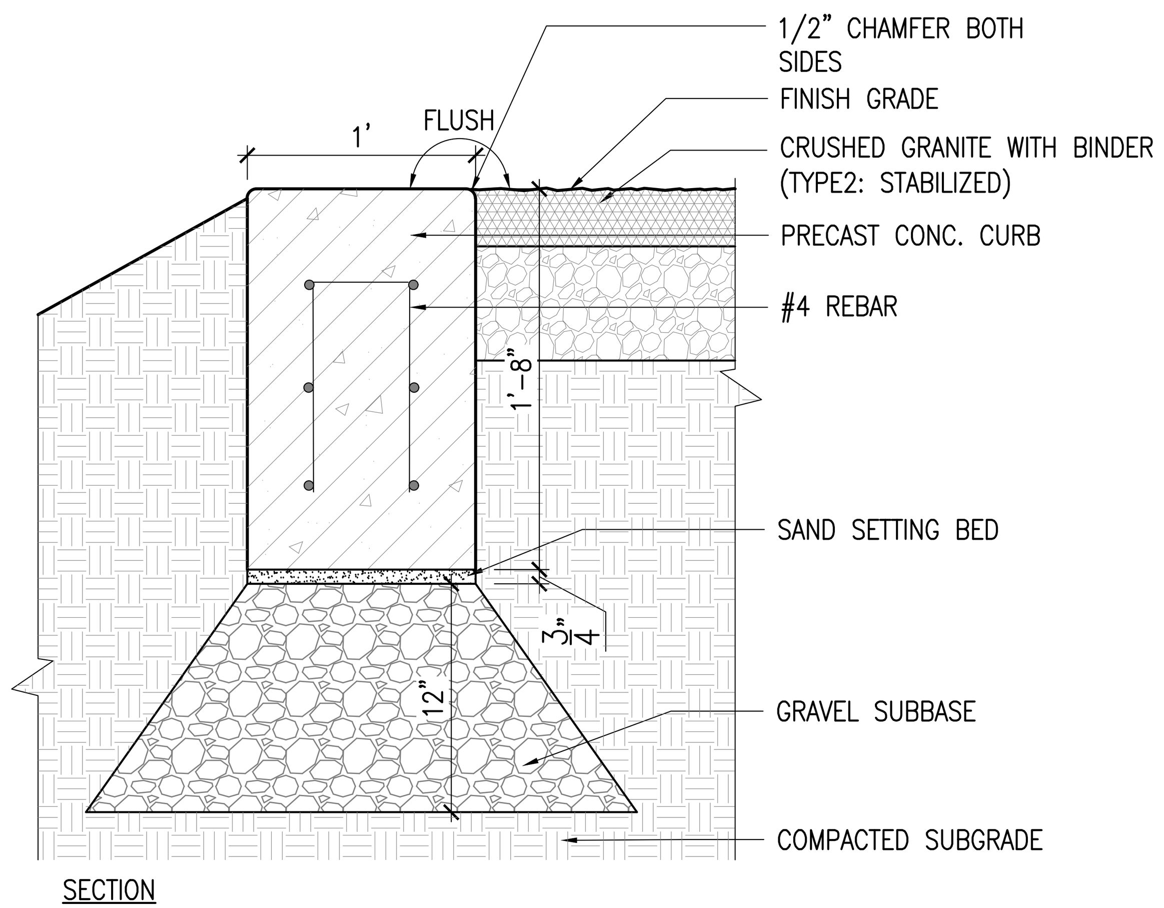
DETAILS

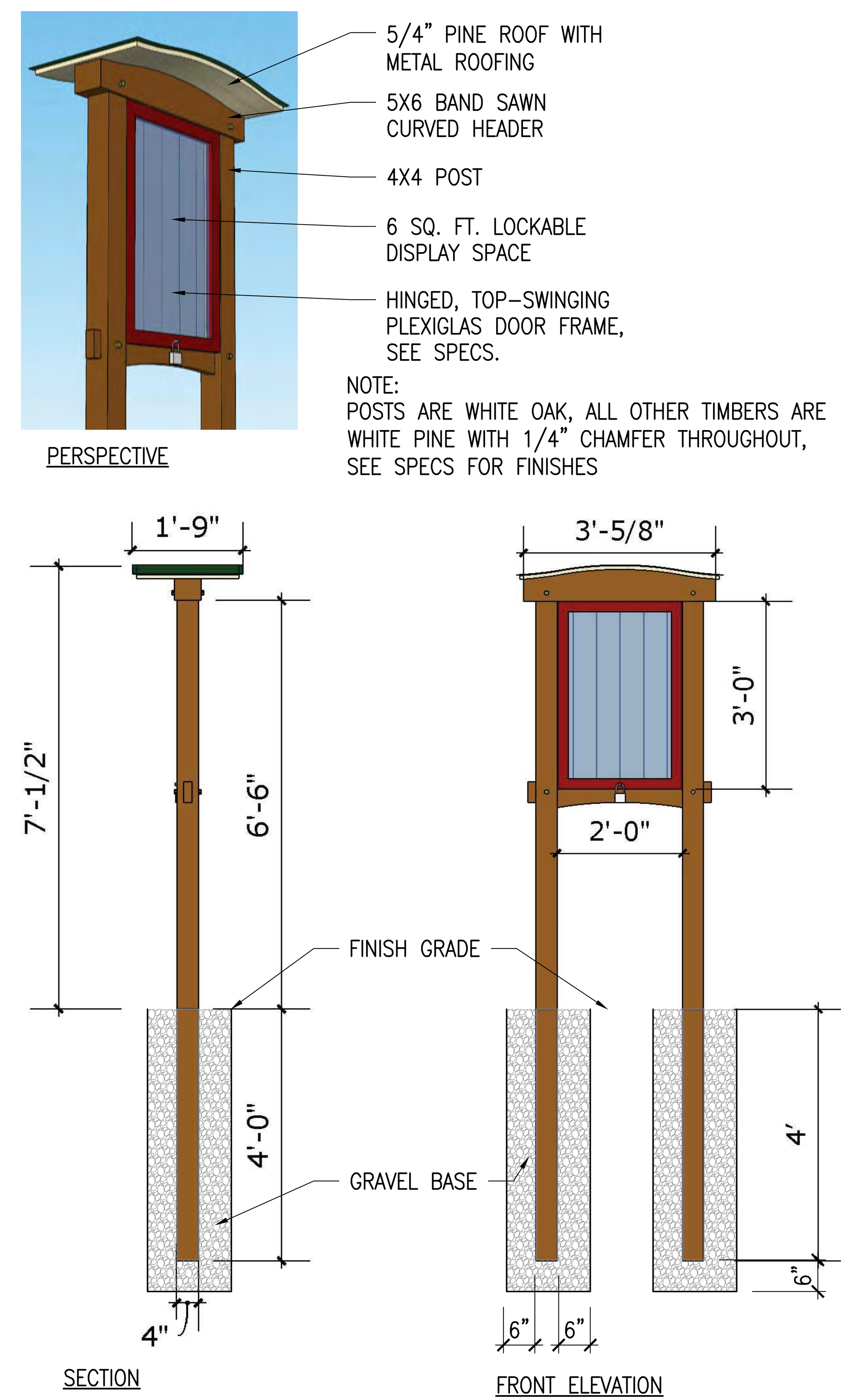
LD1.5



1 CURB RAMP
SCALE: 3/8" = 1'-0"



2 PRECAST CONCRETE CURB
SCALE: 1 1/2" = 1'-0"



3 TRAILHEAD KIOSK
SCALE: 1/2" = 1'-0"

ARLINGTON RESERVOIR - PHASE 2

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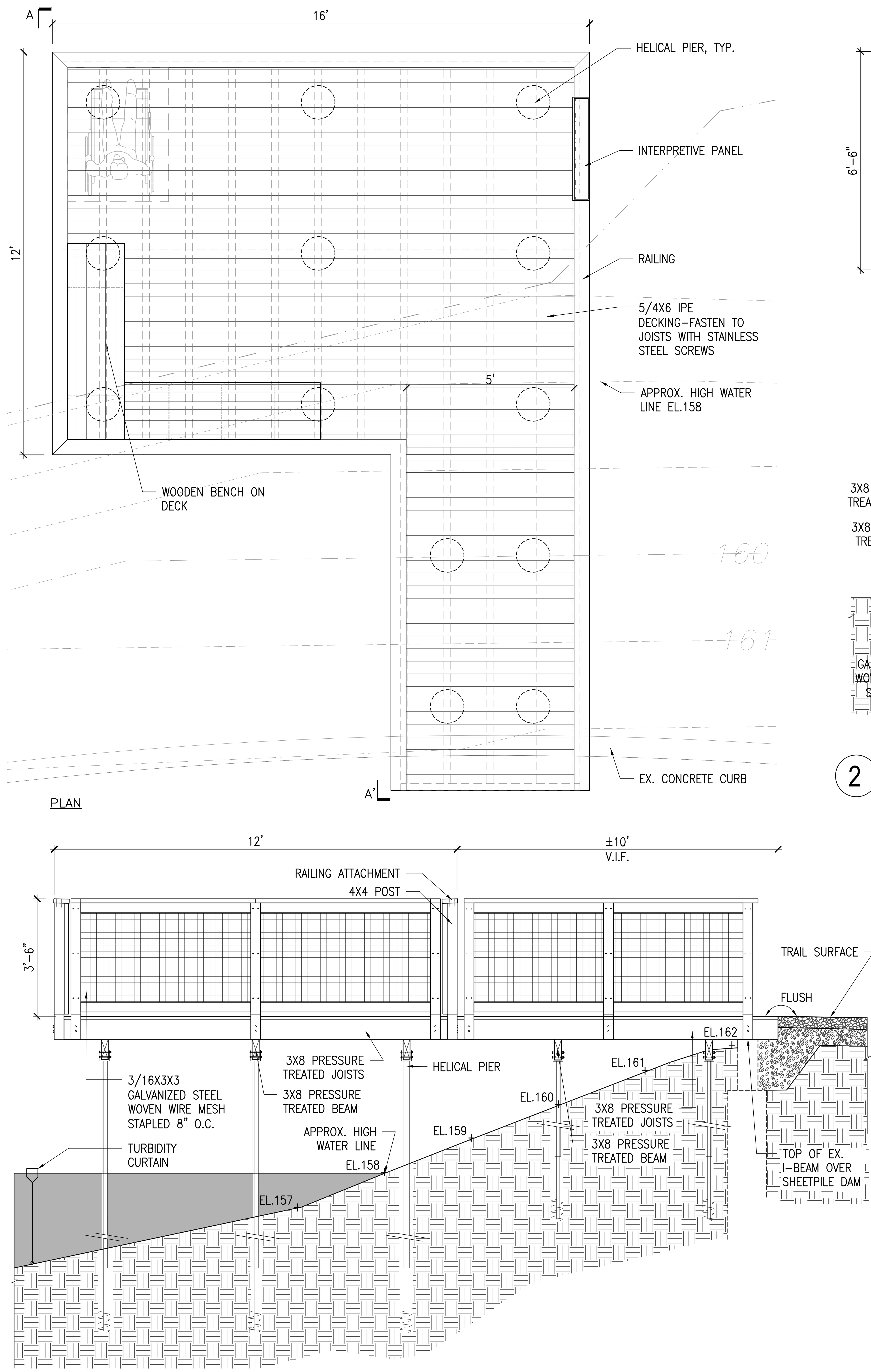
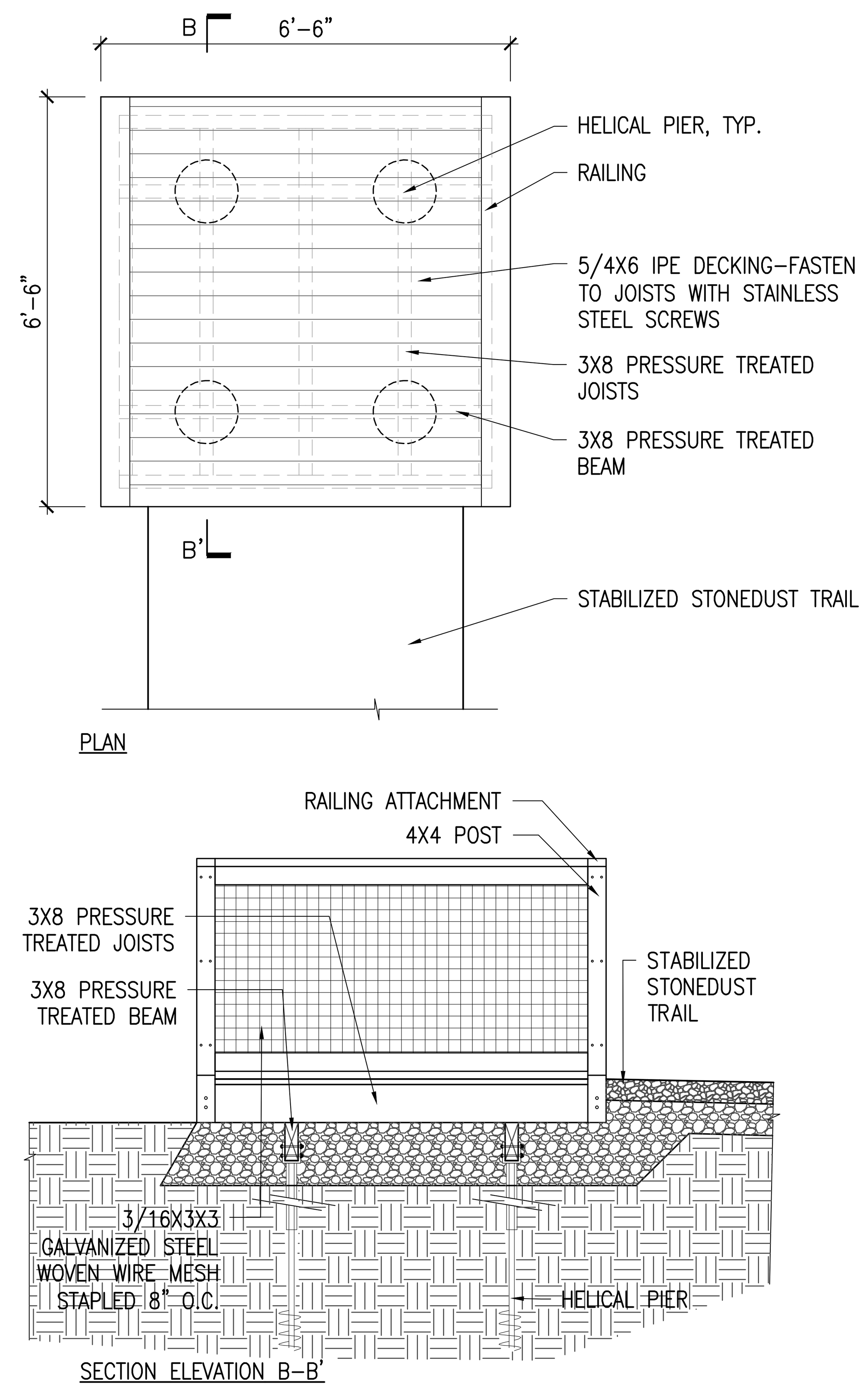
DETAILS

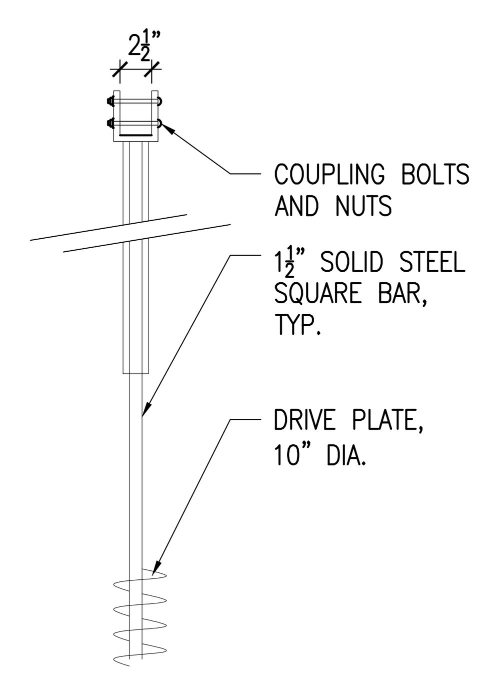
LD1.6



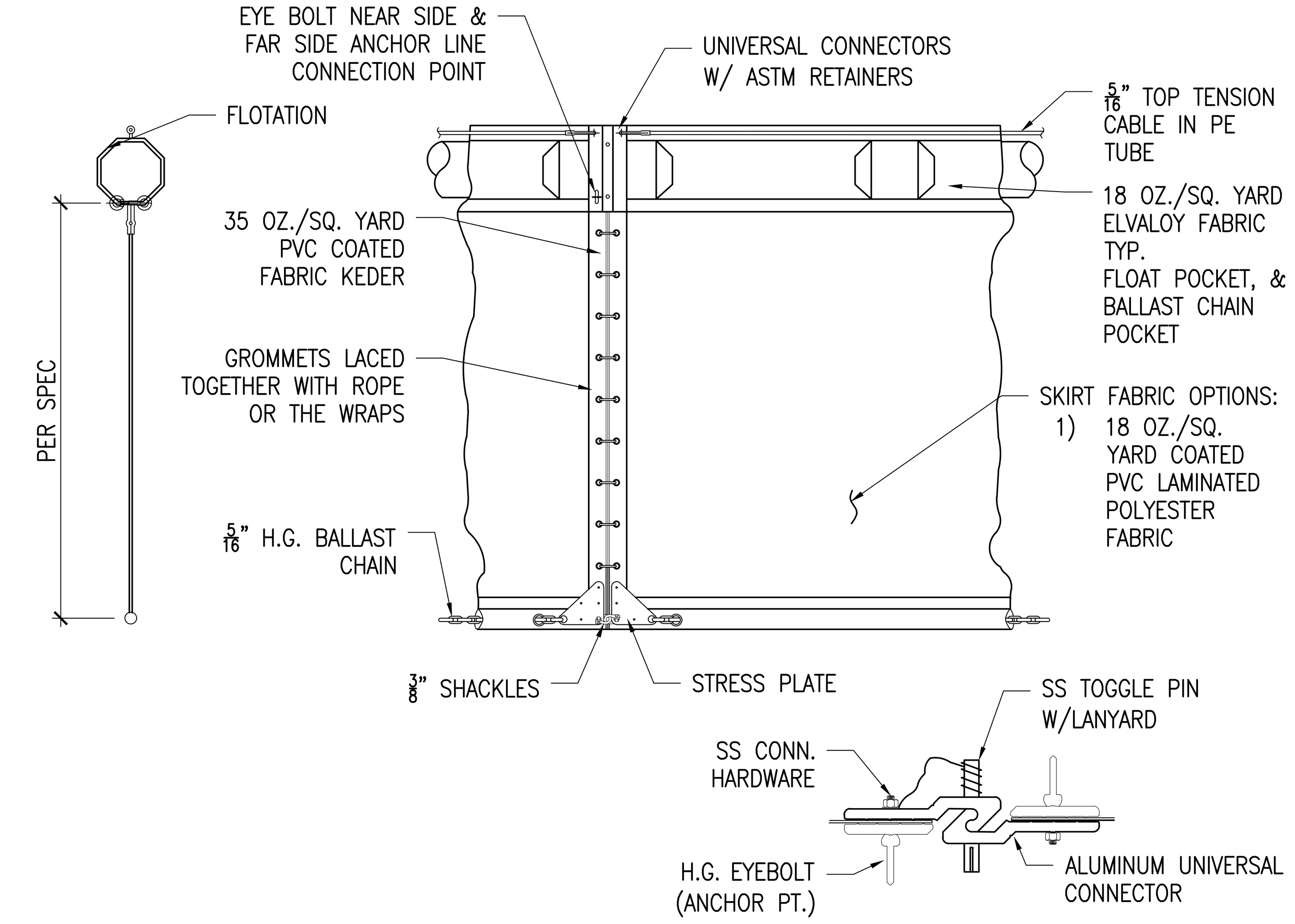
1 OVERLOOK TYPE-1
SCALE: 1/2" = 1'-0"



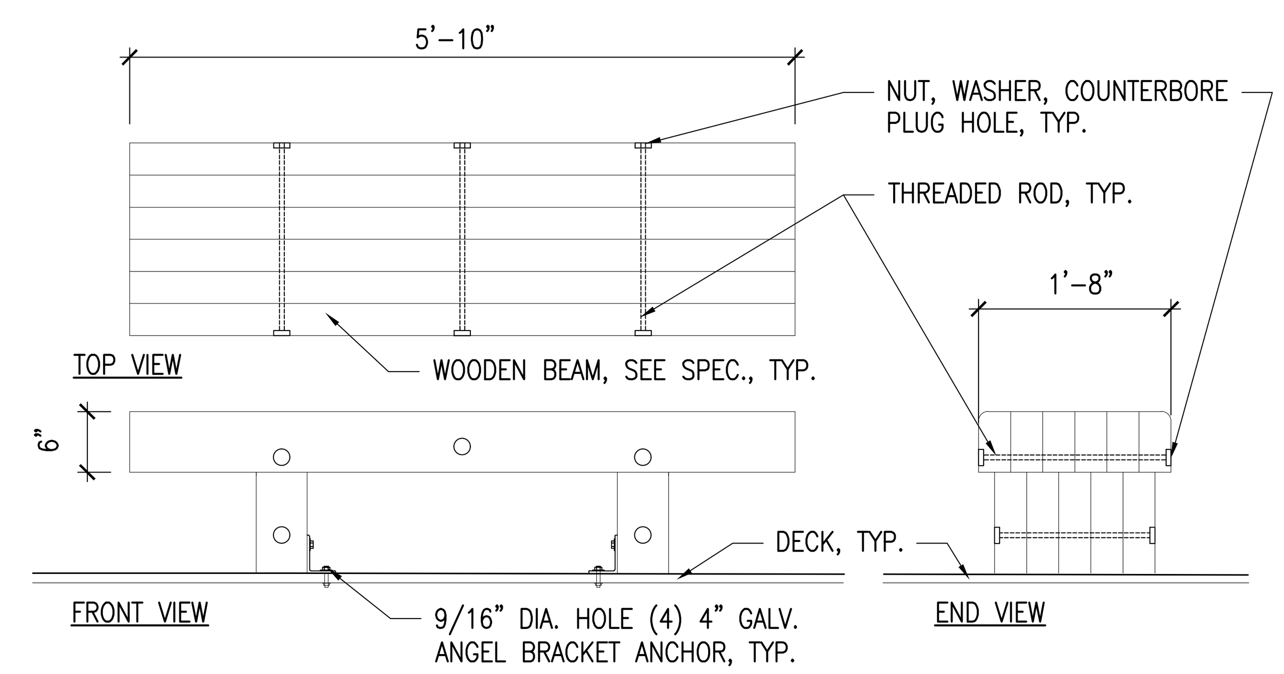
2 OVERLOOK TYPE-2
SCALE: 1/2" = 1'-0"



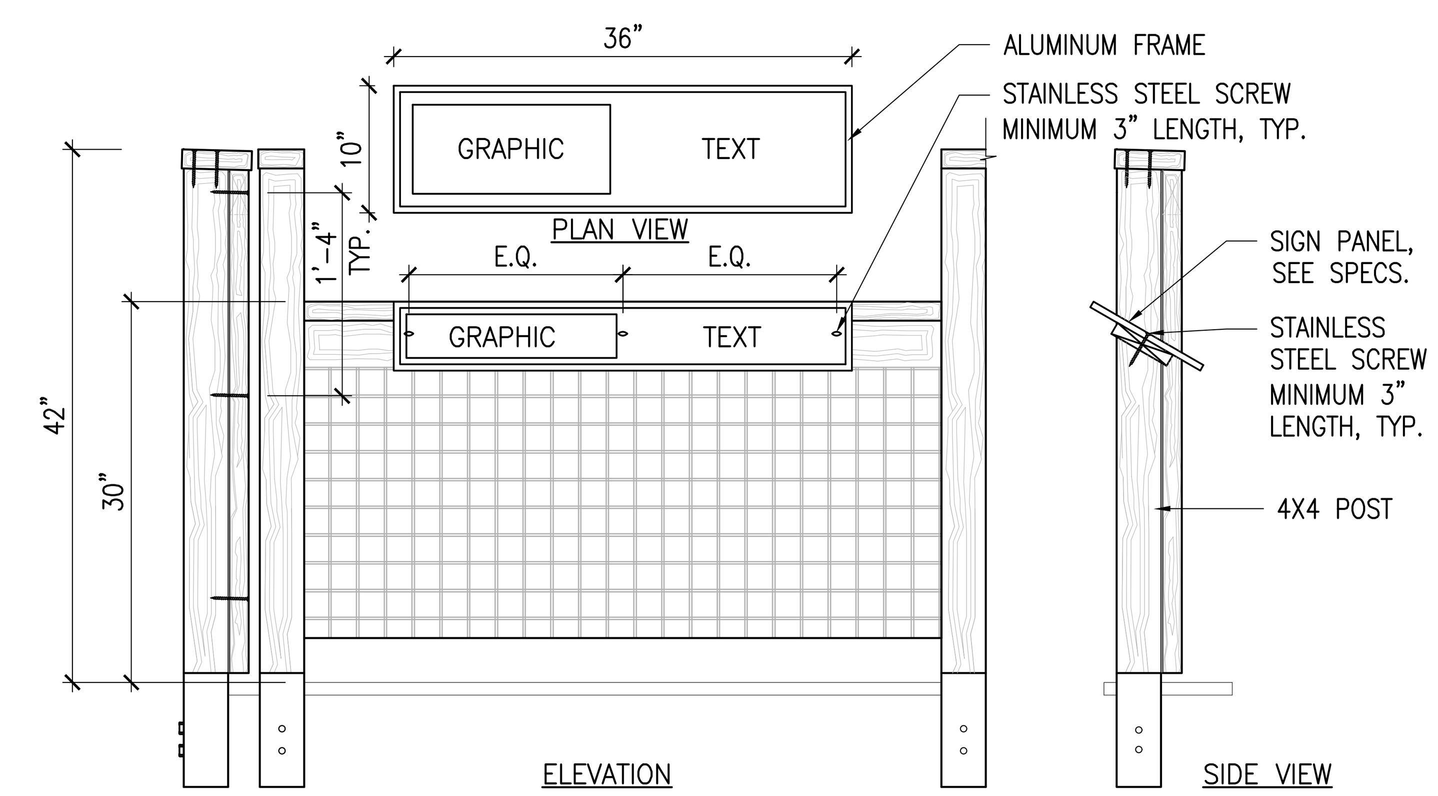
3 HELICAL PIER
SCALE: 1" = 1'-0"



4 TURBIDITY CURTAIN
SCALE: 1" = 1'-0"



5 WOODEN BENCH ON DECK
SCALE: 3/4" = 1'-0"



6 INTERPRETIVE PANEL
SCALE: 1" = 1'-0"

ARLINGTON RESERVOIR - PHASE 2

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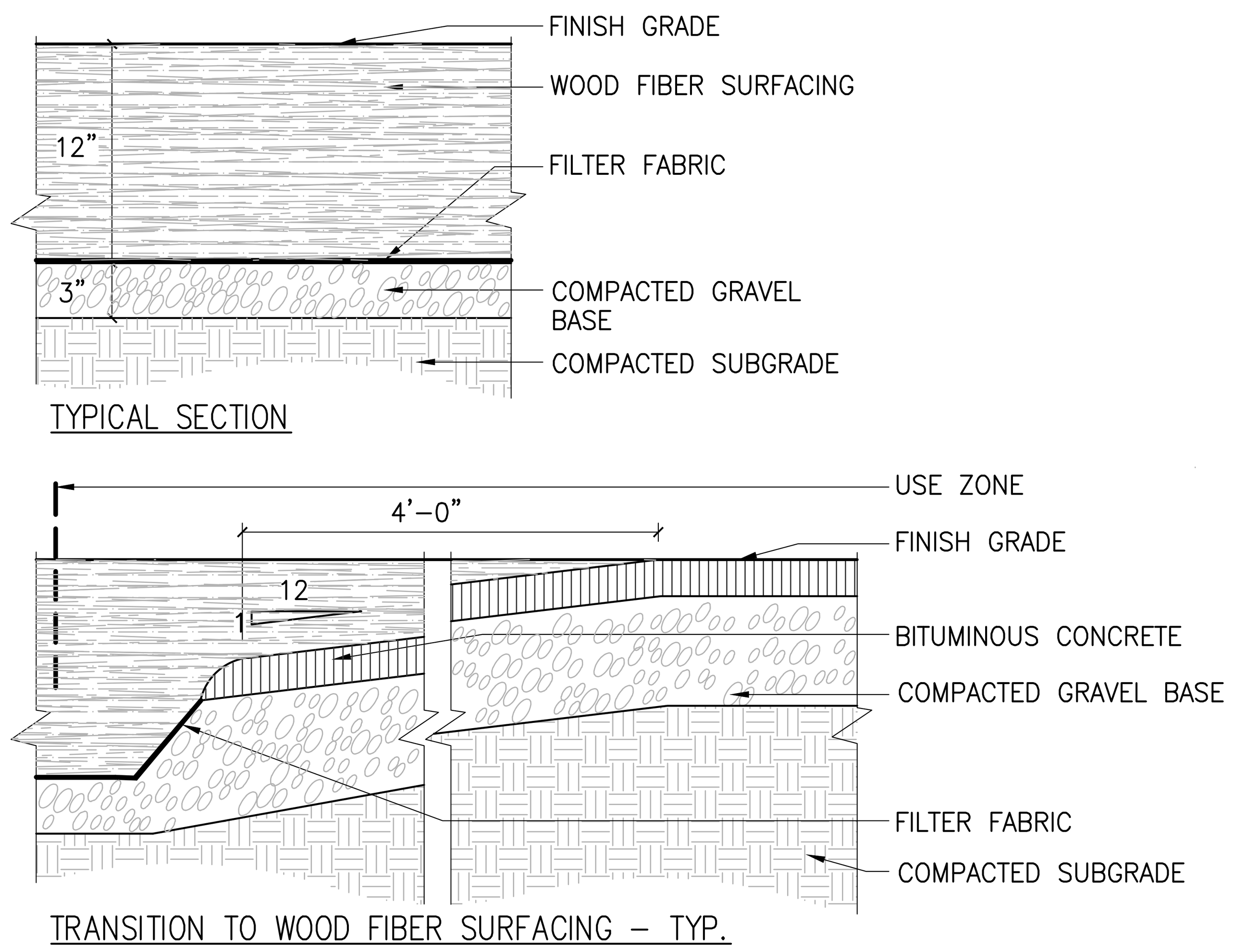
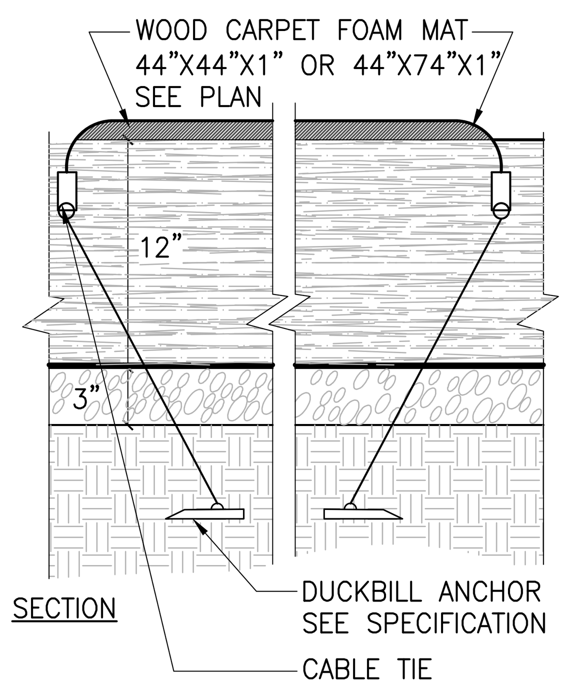
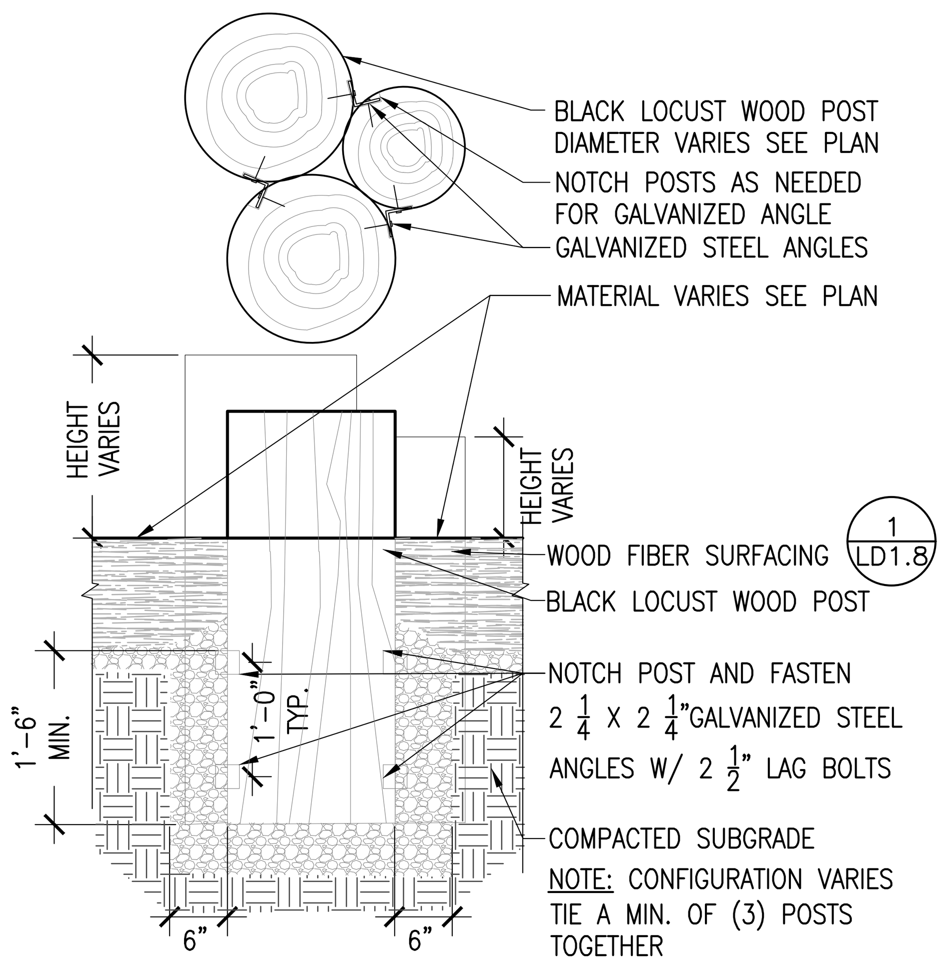
LD1.7



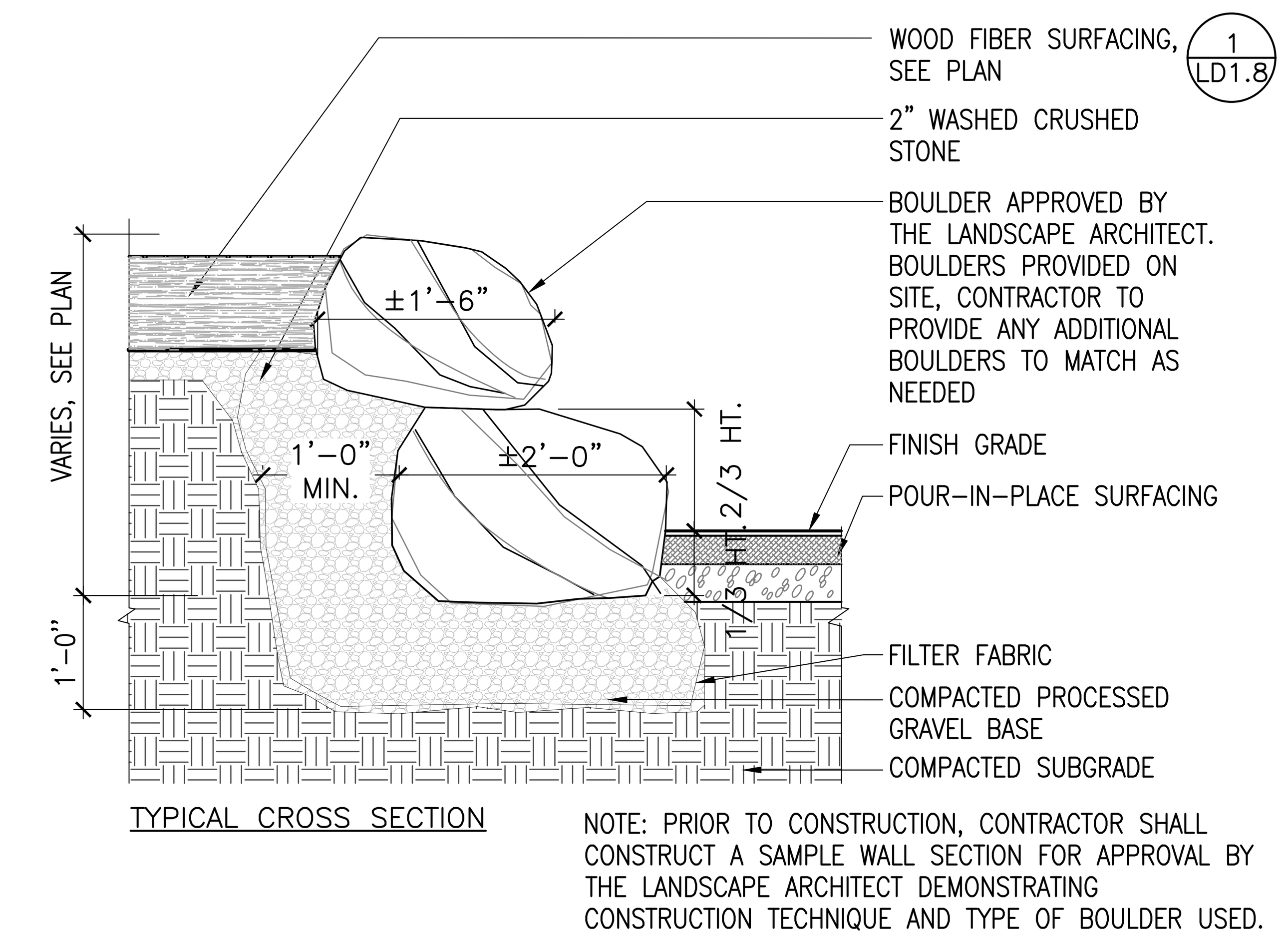
1 WOOD FIBER SURFACING
SCALE: 1 1/2" = 1'-0"



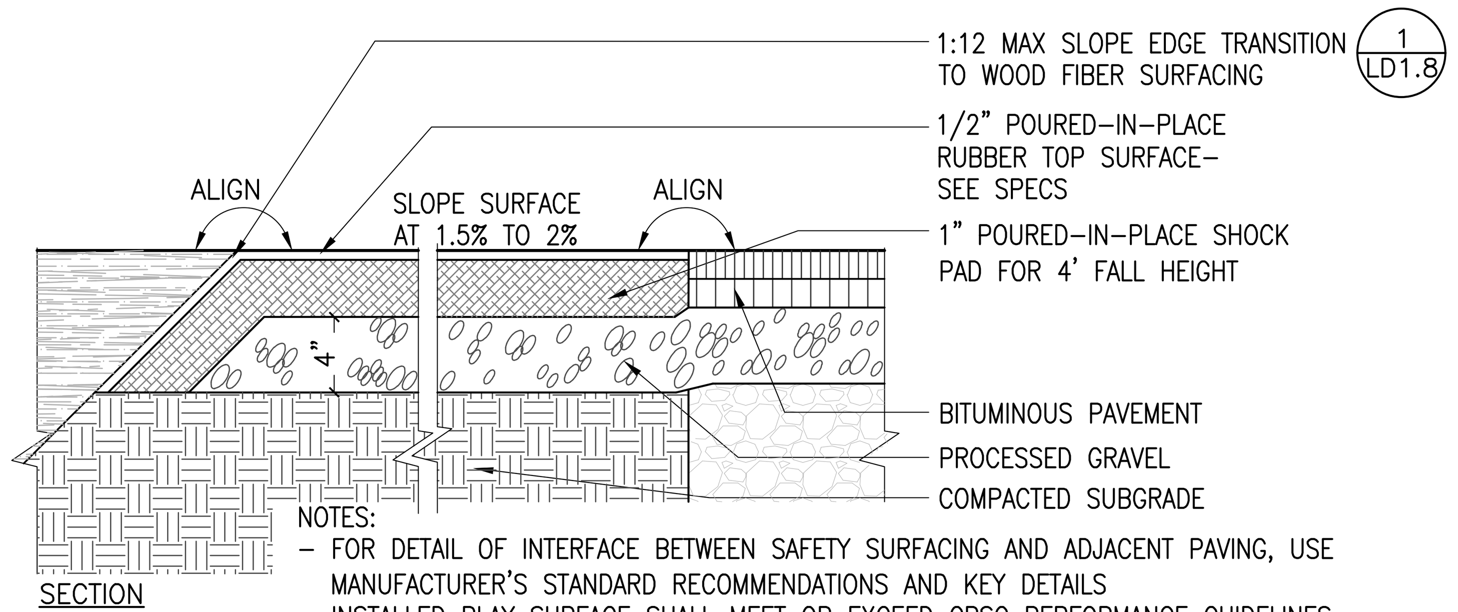
4 WOODCARPET FOAM MAT W/ ANCHOR KIT
SCALE: 1 1/2" = 1'-0"



6 ROBINIA POST
SCALE: 3/4" = 1'-0"

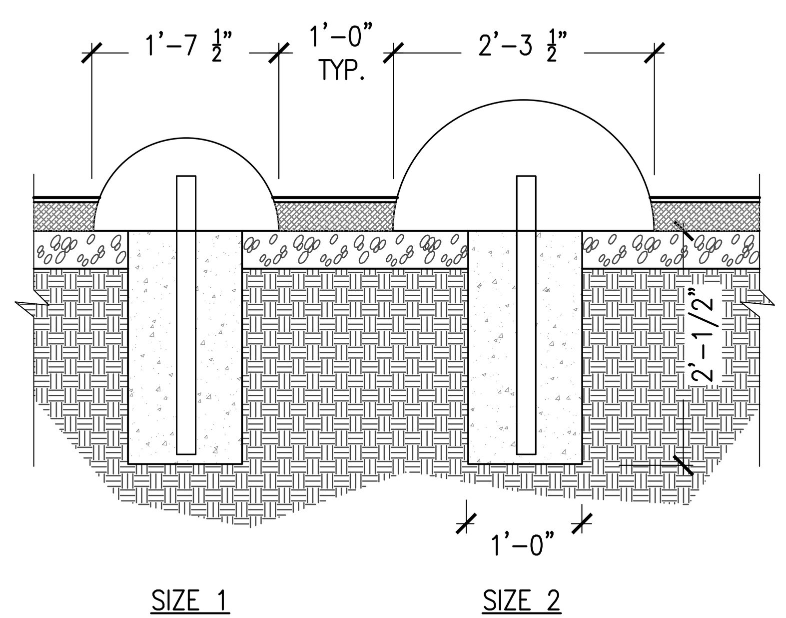


8 BOULDER RETAINING WALL
SCALE: 3/4" = 1'-0"

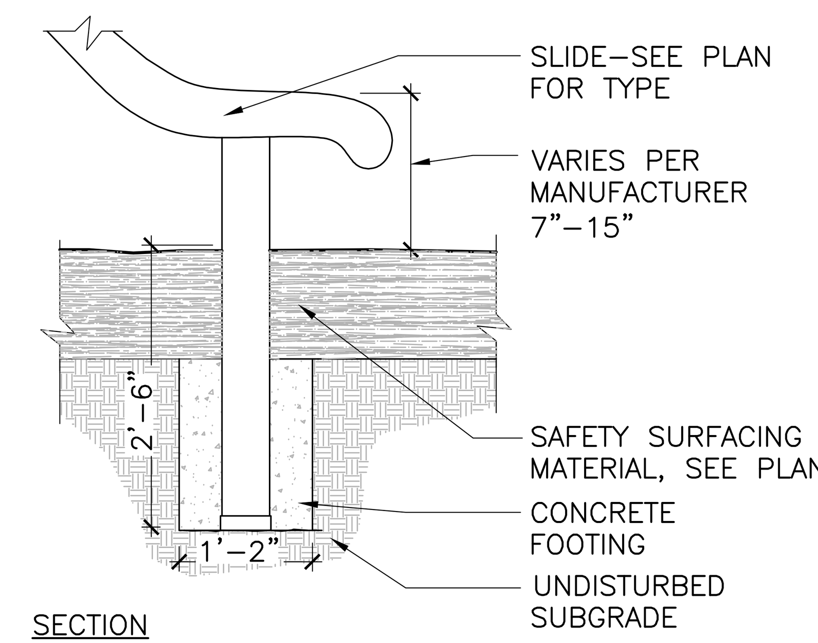


NOTES:
- FOR DETAIL OF INTERFACE BETWEEN SAFETY SURFACING AND ADJACENT PAVING, USE MANUFACTURER'S STANDARD RECOMMENDATIONS AND KEY DETAILS
- INSTALLED PLAY SURFACE SHALL MEET OR EXCEED CPSC PERFORMANCE GUIDELINES WITH RESPECT TO CRITICAL HEIGHTS OF THE IN-PLACE PLAY EQUIPMENT.
- THE THICKNESS SHOWN IN THE CONSTRUCTION DOCUMENTS IF THE MINIMUM REQUIRED.

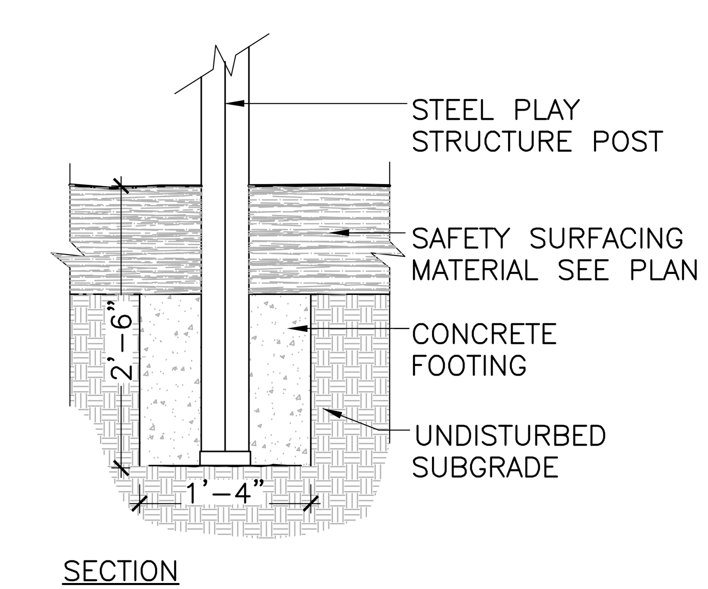
2 POUR-IN-PLACE SURFACING
SCALE: 1 1/2" = 1'-0"



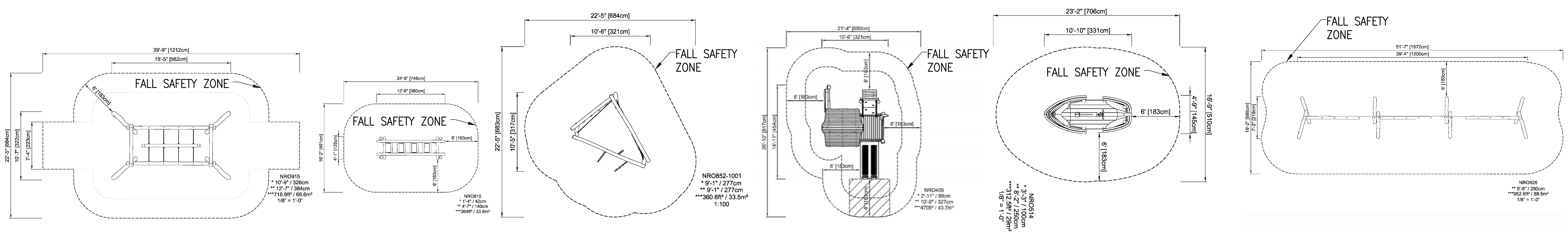
5 RUBBER HALF SPHERES
SCALE: 3/4" = 1'-0"



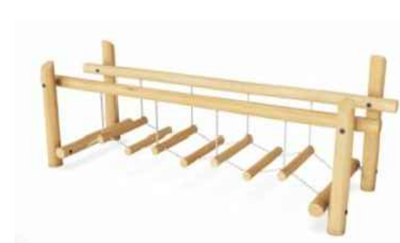
7 SLIDE BOTTOM FOOTING
SCALE: 3/4" = 1'-0"



9 EQUIPMENT POST FOOTING
SCALE: 3/4" = 1'-0"




PLAY STRUCTURE 1


PLAY STRUCTURE 2


PLAY STRUCTURE 3


PLAY STRUCTURE 4


WOODEN SAILBOAT


SWING FRAME - 3 BAYS

NOTE:
- POSTS AND BEAMS TO BE ROBINIA WOOD
- ALL CHAINS AND HARDWARE TO BE STAINLESS STEEL
- SWINGS TO INCLUDE (4) BELT SWINGS, (1) TODDLER SEAT, AND (1) GROUP ROPE CHAIR, SEE SPEC.


EMBANKMENT SLIDE- HDPE. SEE SPECS FOR COLORS


SPRING RIDER

SEE 9 LD1.8 FOR EQUIPMENT POST FOOTING

NOTE:
- SEE SPEC FOR EQUIPMENT FINISHES AND COLORS
- INSTALLED PLAY SURFACE SHALL MEET OR EXCEED CPSC PERFORMANCE GUIDELINES WITH RESPECT TO CRITICAL FALL HEIGHTS OF THE IN-PLACE PLAY EQUIPMENT.

3 PLAY EQUIPMENT
SCALE: N.T.S.

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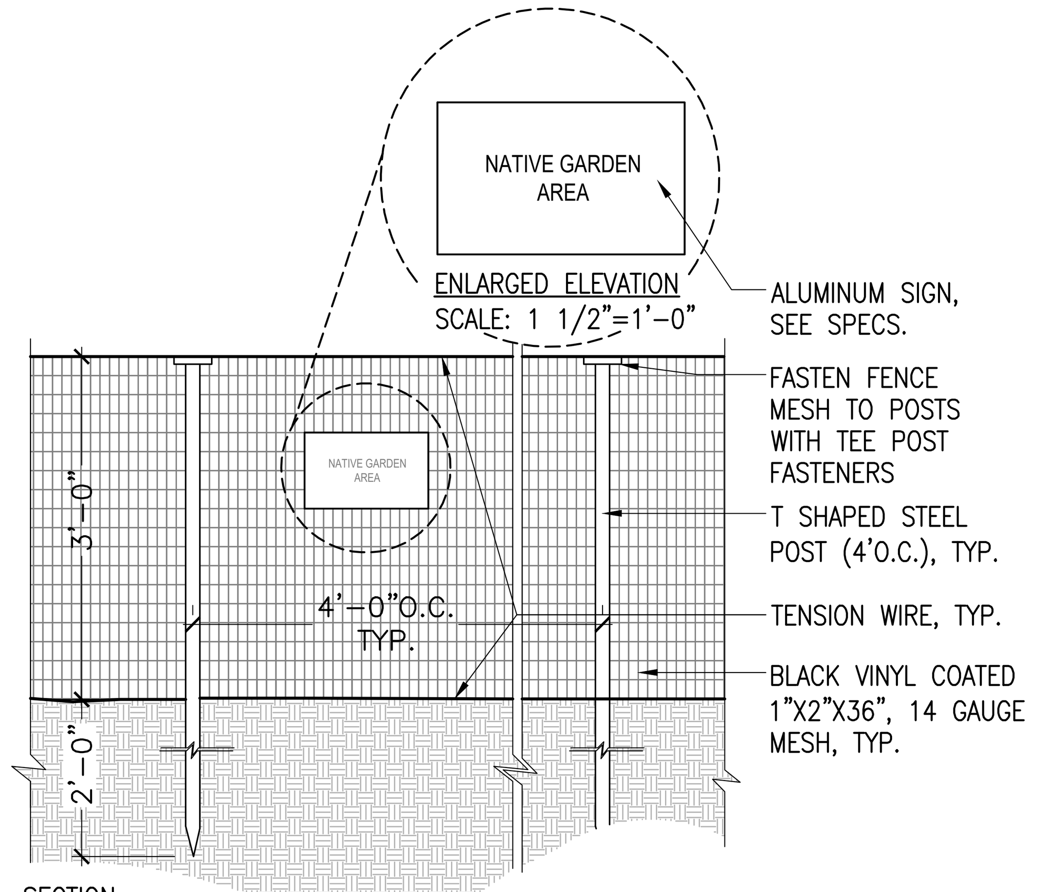
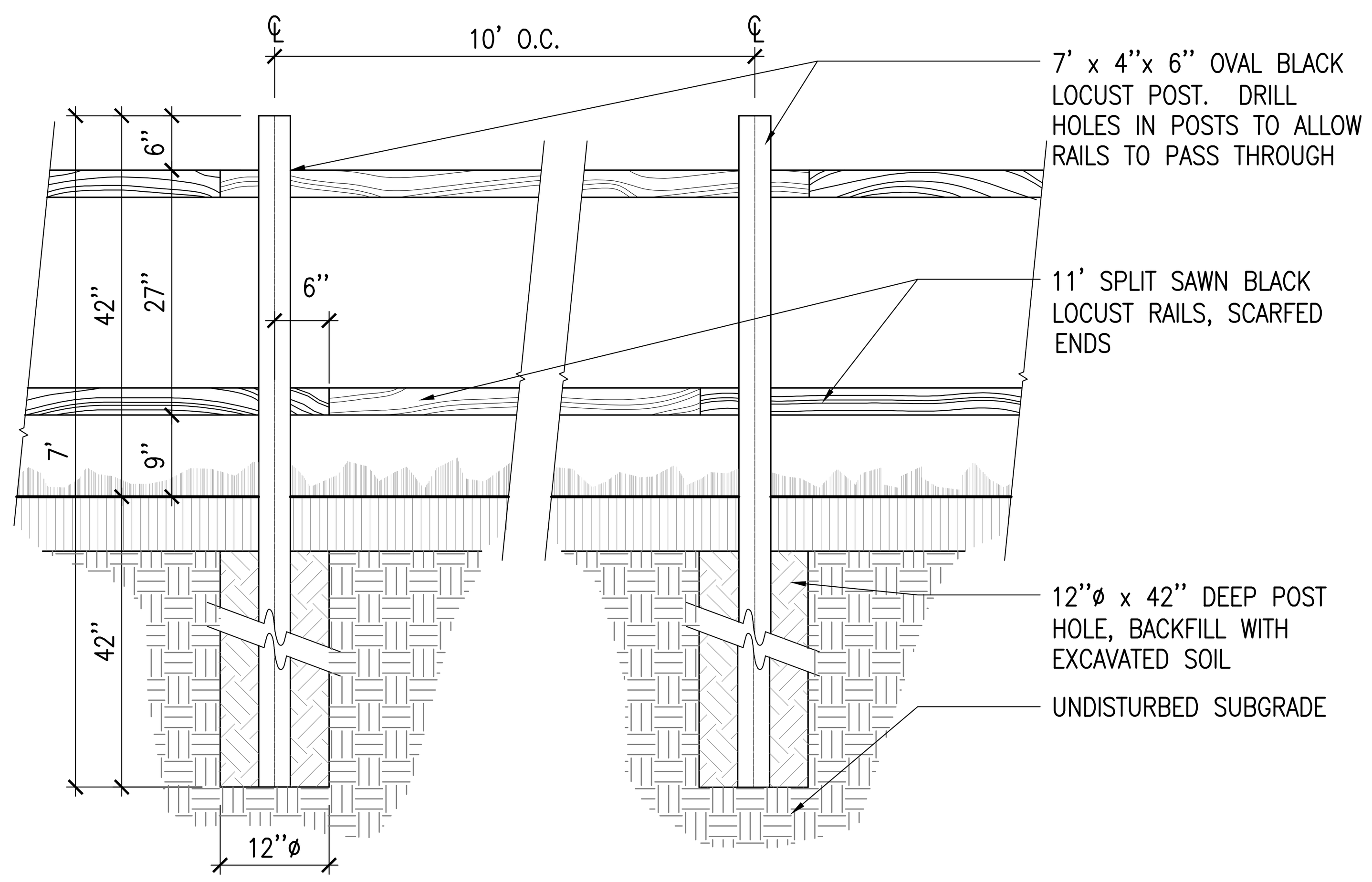


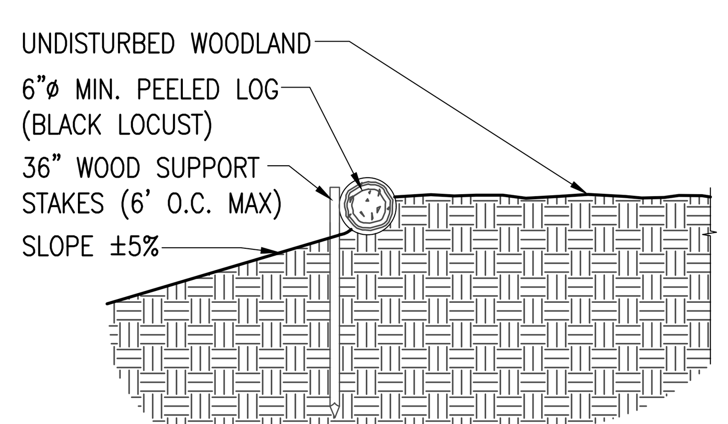
1 NATIVE GARDEN PROTECTIVE FENCE

SCALE: 3/4" = 1'-0"



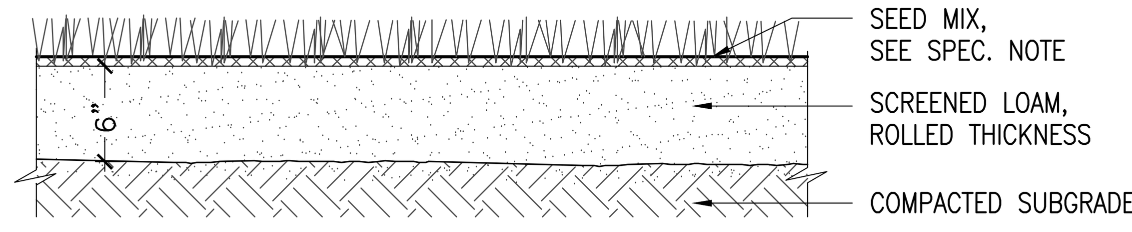
2 SPLIT RAIL FENCE

SCALE: 3/4" = 1'-0"



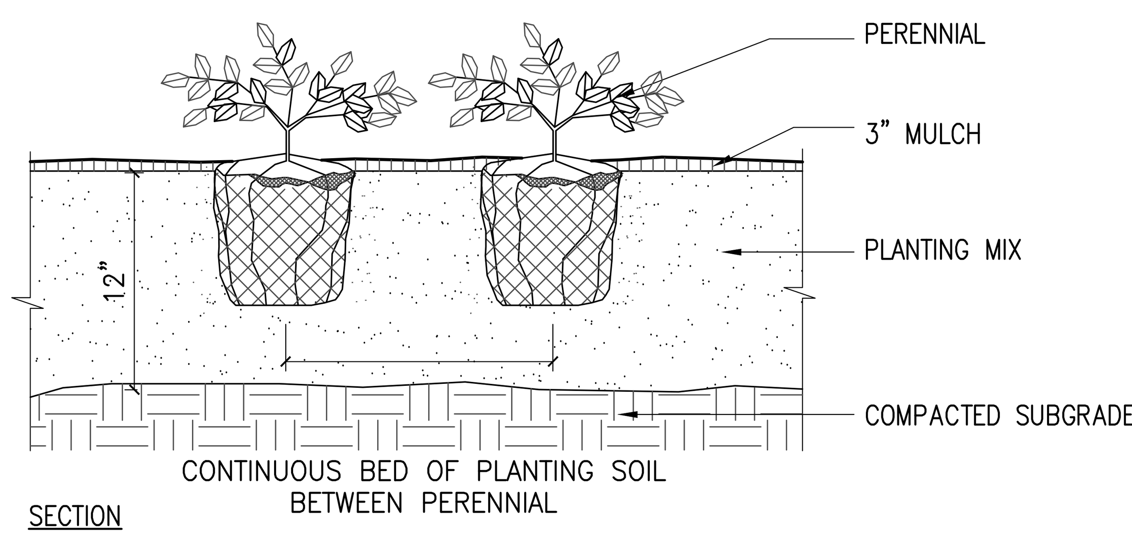
3 TRAIL CRIBBING/ WATER DAM

SCALE: 3/4" = 1'-0"



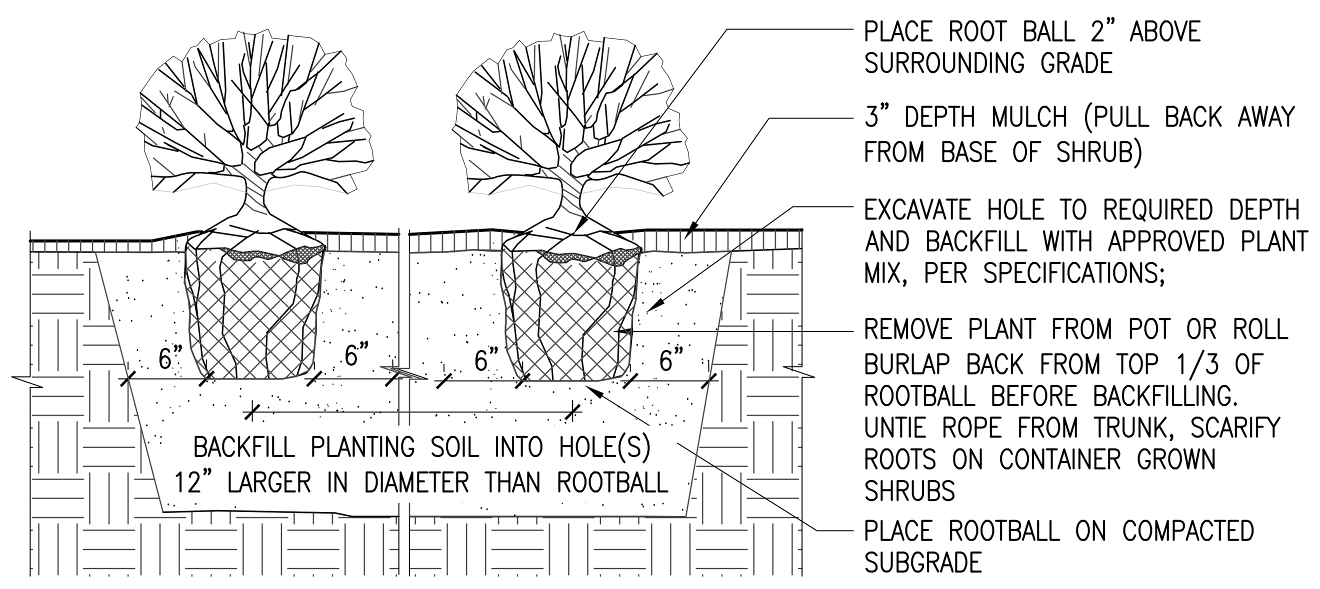
4 SEEDING

SCALE: 1 1/2" = 1'-0"



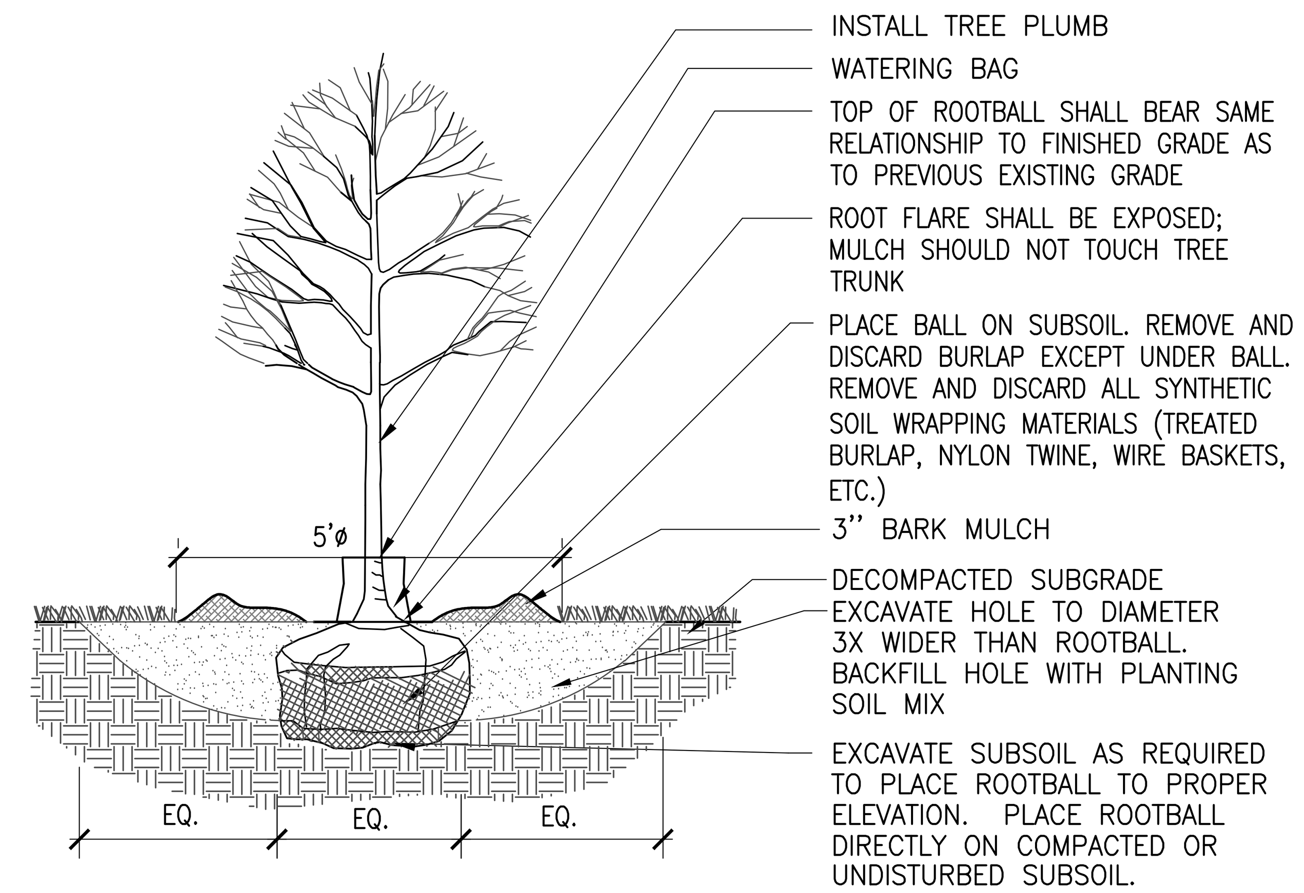
5 PERENNIAL PLANTING

SCALE: 1 1/2" = 1'-0"



6 SHRUB PLANTING

SCALE: 1 1/2" = 1'-0"

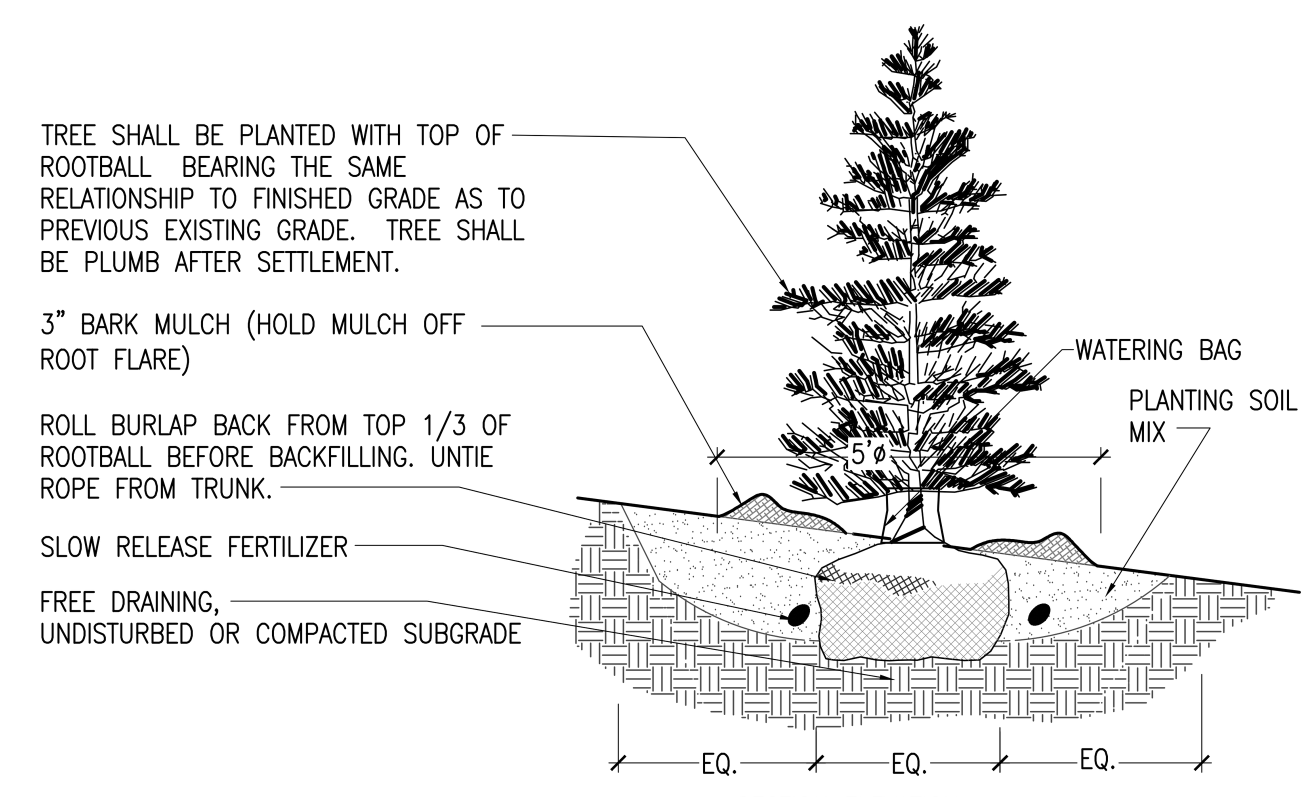


NOTES

1. IF CONTAINER GROWN SCARIFY SOIL AND ROOTS TO REMOVE CIRCLING ROOTS

7 DECIDUOUS TREE

SCALE: N.T.S.



8 EVERGREEN TREE

SCALE: N.T.S.

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE

kzla
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MASSACHUSETTS KYLE S. ZICK REGISTERED LANDSCAPE ARCHITECT

100% DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB | Checked By: KZ
Date: NOVEMBER 13, 2020
Scale: AS SHOWN
Drawing Title:

DETAILS

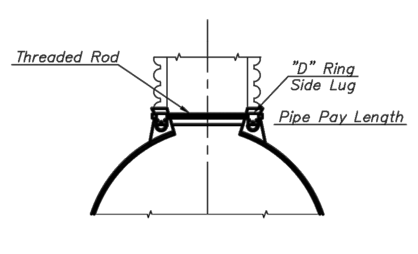
LD1.9

END SECTIONS FOR HDPE PIPE								
Dia.	Gauge	Weight	* A	* H	* L	* W	Slope	Overall Width
6"	18	10	4	3	8	12	2	20"
8"	18	14	5 3/4	4	14 1/2	16	2 1/4	27 1/2"
10"	18	17	7 5/8	6	14 1/2	20	2 1/2	35 1/4"
12"	16	25	7	6	21	24	2 1/2	38"
15"	16	33	8	6	26	30	2 1/2	46"
18"	16	42	8	6	31	36	2 1/2	52"
21"	16	49	9	6	36	42	2 1/2	60"
24"	16	65	10	6	41	48	2 1/2	68"
30"	14	123	12	8	51	60	2 1/2	84"
36"	14	135	14	9	60	72	2 1/2	100"
42"	12	320	16	11	69	84	2 1/2	116"
48"	12	375	18	12	78	90	2 1/4	126"
54"	12	440	18	12	84	102	2 1/4	138"
60"	12/10	610	18	12	87	114	2	150"

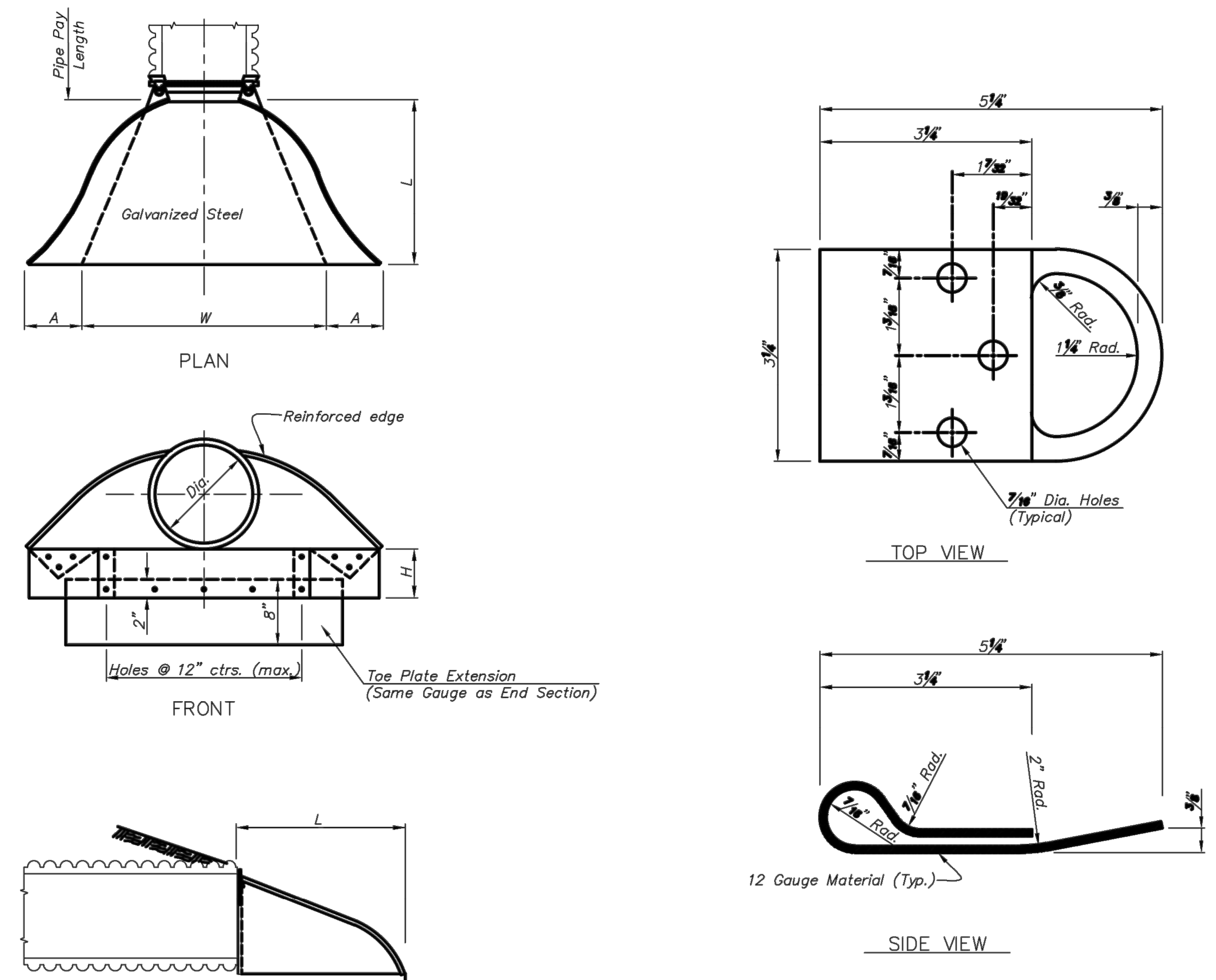
Toe plate extensions where specified, to be punched to match holes in apron lip. 3/8" bolts to be furnished. The length of toe plate to be as follows: W + 10" for 12" to 30" diameter pipes inclusive.
W + 20" for 36" to 60" diameter pipes inclusive.

Multiple panel end sections shall have lap seams which are to be tightly jointed by bolts. Corner plate, and toe plate to be same gauge as end section.

* – Dimensions in Inches Plus or Minus Standard Shop Tolerance.

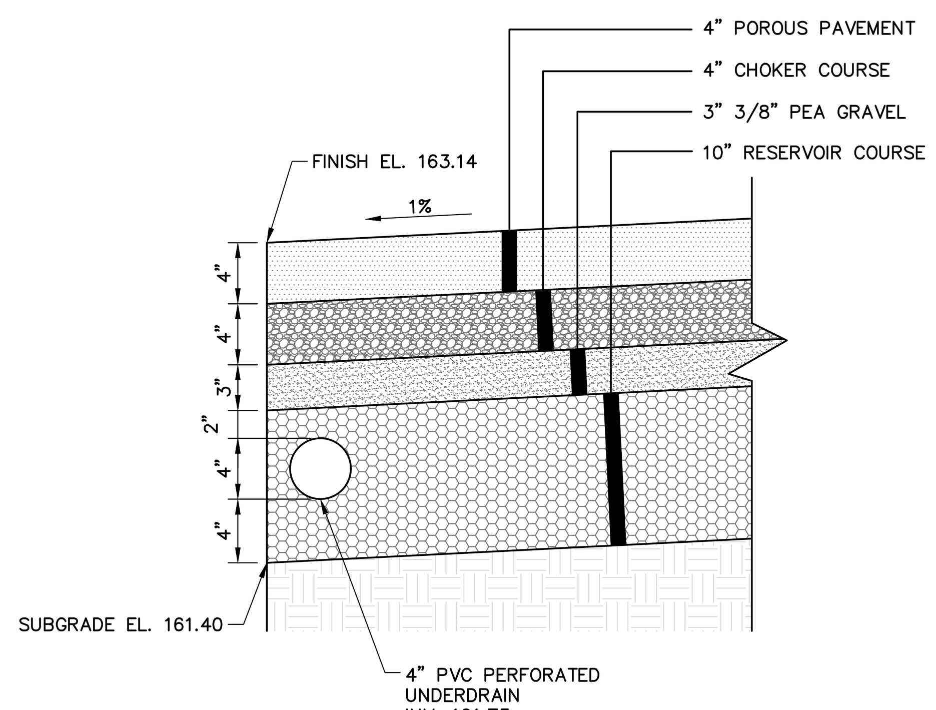


TYPE 2 CONNECTIONS
(12" & Larger)

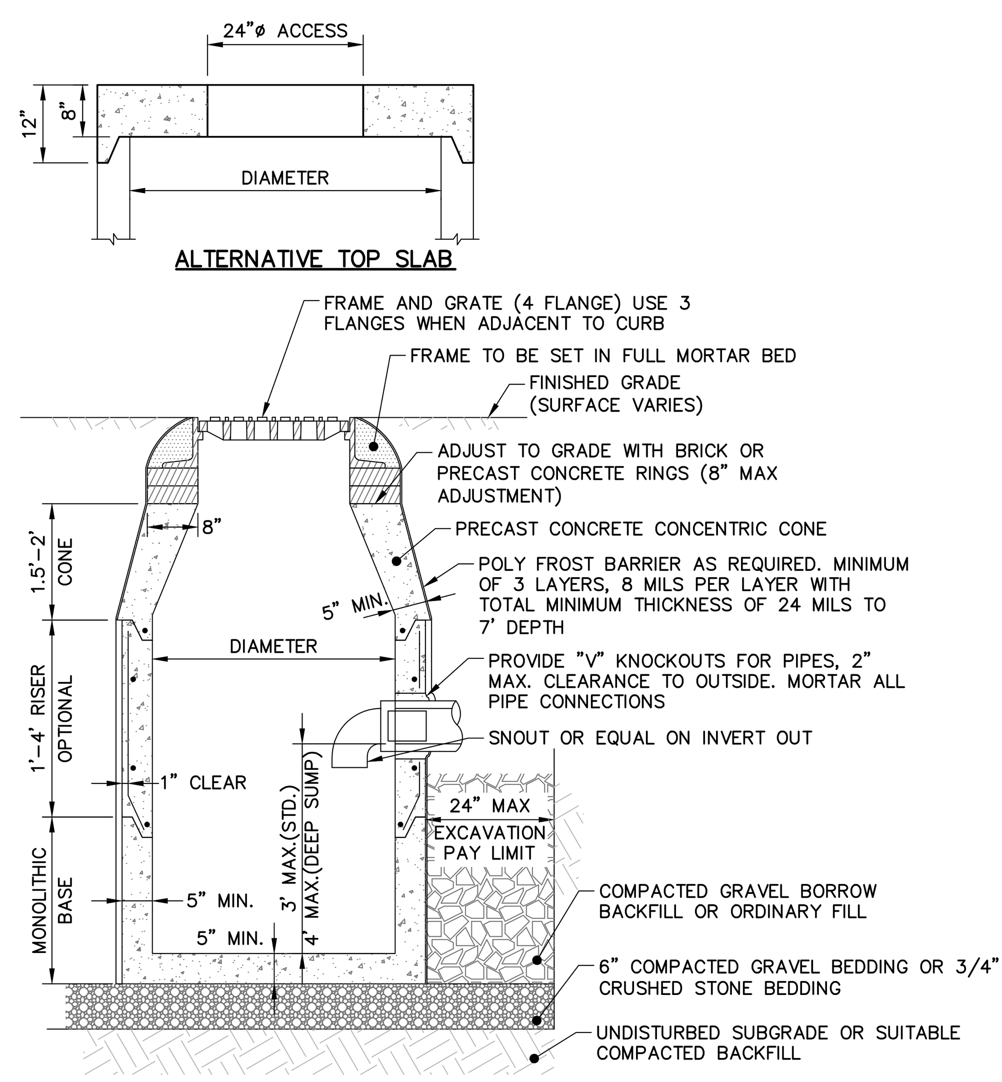


"D" RING SIDE LUG
TYPE 2 ATTACHMENT DETAILS

FLARED PIPE END DETAIL
N.T.S.



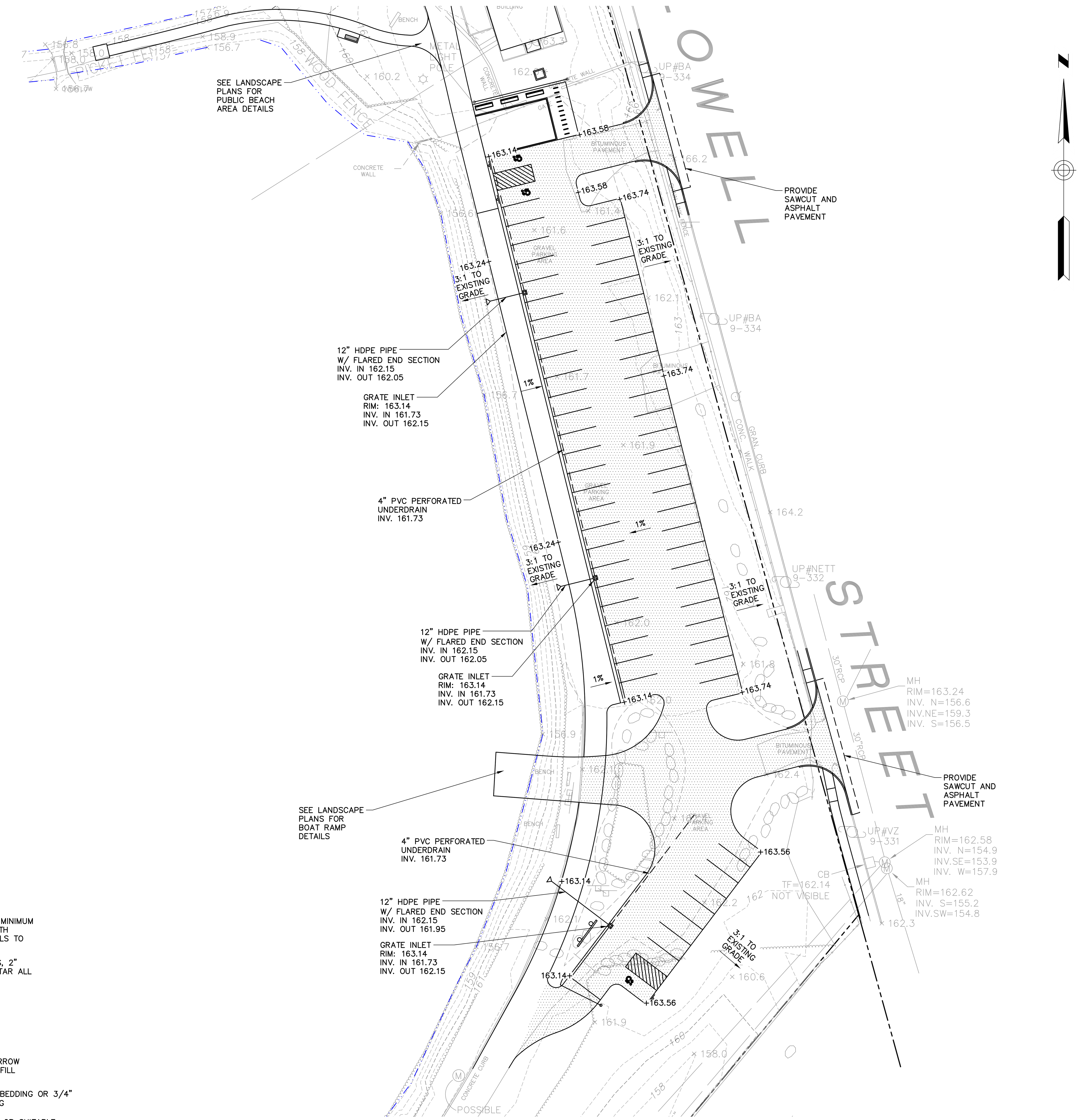
POROUS PAVEMENT SECTION
N.T.S.



NOTES:

1. PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL BE SUITABLE FOR HS-20 LOADINGS.
2. PRECAST CONCRETE STRUCTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. ALTERNATE TOP SLAB MAY BE USED AS DICTATED BY DESIGN AND/OR FIELD CONDITIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
5. CATCH BASIN FRAME AND GRATE(S) SHALL MEET MUNICIPAL AND STATE SPECIFICATIONS WHEN APPLICABLE.

PRECAST CONCRETE CATCH BASIN
NOT TO SCALE



BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

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COMMITMENT & INTEGRITY DRIVE RESULTS

COMMONWEALTH OF MASSACHUSETTS
DENISE L. CAMERON
CIVIL
No. 53546
REGISTERED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION

DESIGNED BY: LT
CHECKED BY: BM
DRAWN BY: BCM
0233115.00 – C-1.dwg

DRAINAGE PLAN

TOWN OF ARLINGTON
ARLINGTON, MASSACHUSETTS

ARLINGTON RESERVOIR
PHASE 2

JOB NO.: 0233115.00
DATE: NOVEMBER 2020
SCALE: 1"=30'
SHEET: 1 OF 2

C1.0

24x36 SHEET
1:1

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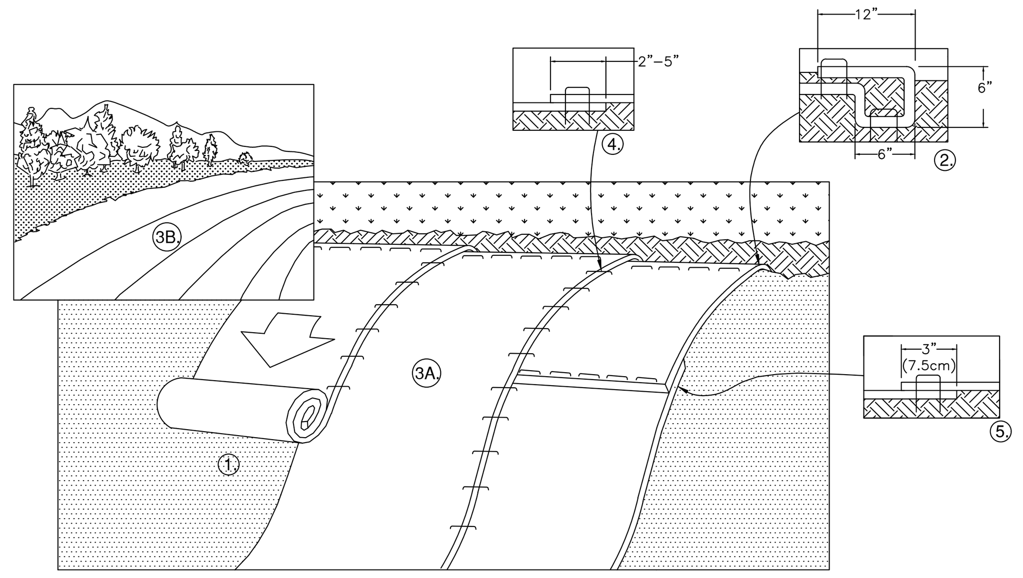


1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED AS WELL AS REMOVING ANY PROTRUDING ROCKS, STUMPS OR ROOTS. DURING THE GROWING SEASON (APRIL 15–SEPTEMBER 15) USE RECP'S ON THE BASE OF GRASSED WATERWAYS, SOIL SLOPES HAVING A GRADE GREATER THAT 15%, OR ANYWHERE WHERE HAY MULCH HAS PROVEN TO BE INEFFECTIVE AT CONTROLLING SHEET EROSION. RECP'S ARE A MANUFACTURED COMBINATION OF MULCH AND NETTING DESIGNED TO PREVENT EROSION AND RETAIN SOIL MOISTURE. FOR OVER WINTER PROTECTION, APPLY RECP'S ON THE BASE AND SIDE SLOPES OF GRASSED WATERWAYS AND ON SLOPES STEEPER THAN AN 8% GRADE.

2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP's EXTENDED BEYOND THE UP–SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECP's.

3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.

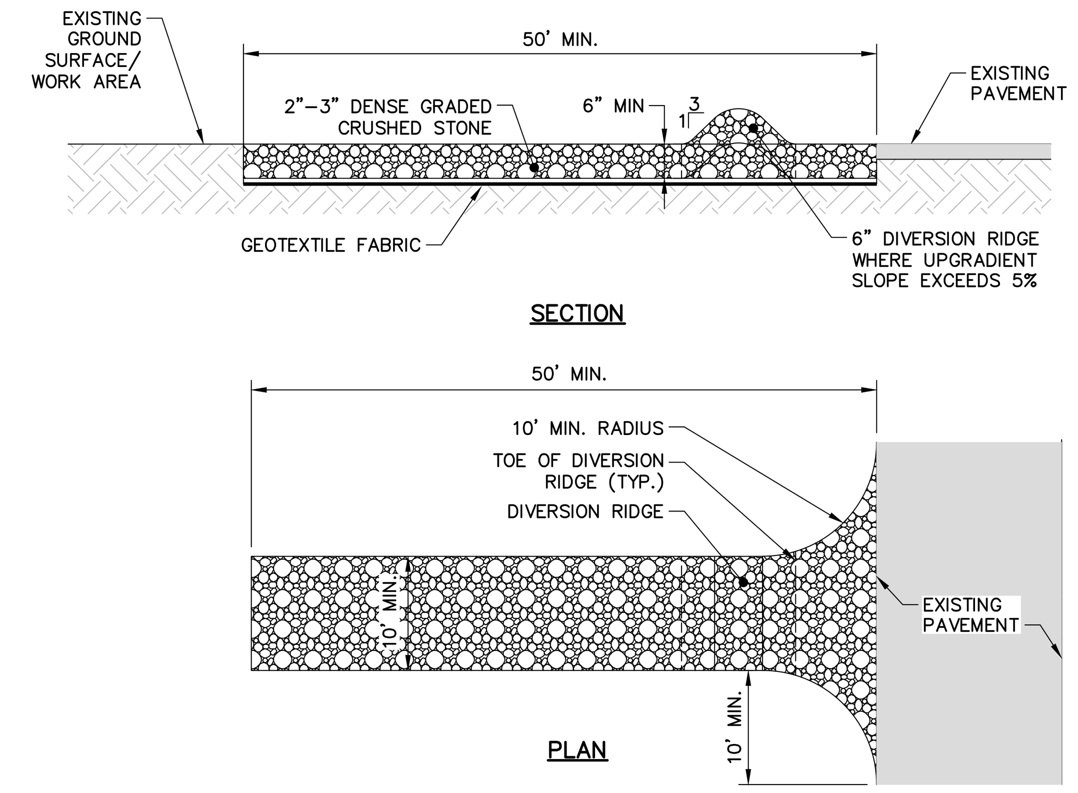
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" OVERLAP DEPENDING ON RECP's TYPE.

5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE RECP's WIDTH. NOTE: *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.

6. UNTIL GRASS IS ABUNDANT, INSPECT PERIODICALLY AND AFTER EACH RAINSTORM TO CHECK FOR EROSION. IMMEDIATELY REPAIR AND ADD MORE MULCH UNTIL GRASSES ARE FIRMLY ESTABLISHED. DO NOT MOW THE FIRST YEAR.

ROLLED EROSION CONTROL MATTING

N.T.S.

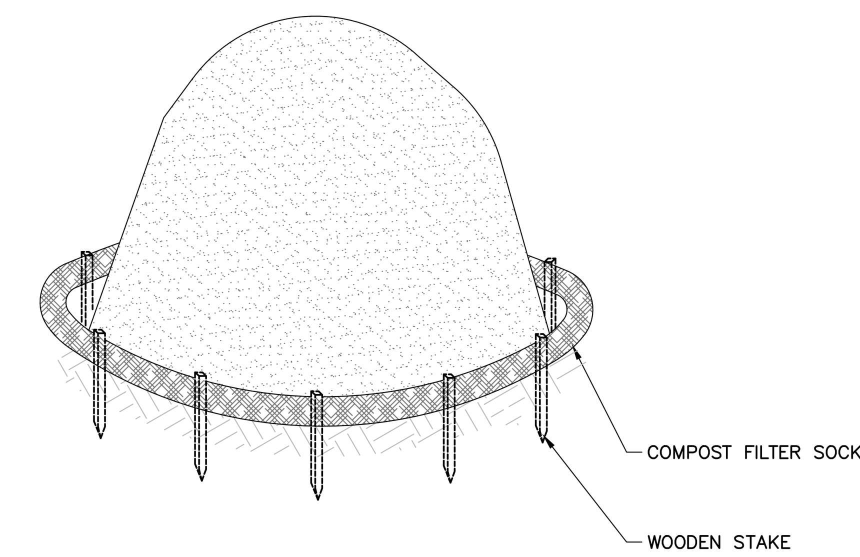


NOTES:

1. GRADE TOWARDS SEDIMENT BARRIER WHEN NECESSARY TO MANAGE FLOW.
2. INCREASE MINIMUM LENGTH TO 100' WHERE TRACKED SEDIMENTS CONTAIN LESS THAN 80% SAND OR AS NECESSARY FOR HEAVY CONSTRUCTION.

STABILIZED CONSTRUCTION ENTRANCE/EXIT

N.T.S.



NOTES:

1. STOCKPILES SHALL BE SURROUNDED BY COMPOST FILTER SOCKS.
2. STOCKPILES SHALL HAVE A MAXIMUM 2:1 (H:V) SIDE SLOPE.
3. REPAIR OR REPLACE DAMAGED COMPOST FILTER SOCKS DUE TO CONSTRUCTION ACTIVITIES OR STOCKPILE MITIGATION.

TEMPORARY SOIL STOCKPILE

N.T.S.

30' 0 30' 60'
BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

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COMMONWEALTH OF MASSACHUSETTS
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No. 53048
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE

DESIGNED BY: LT
DRAWN BY: BCM
CHECKED BY: BM
0233115.00 – C-1.dwg

EROSION & SEDIMENT CONTROL DETAILS

TOWN OF ARLINGTON
ARLINGTON, MASSACHUSETTS

ARLINGTON RESERVOIR
PHASE 2

JOB NO.: 0233115.00
DATE: NOVEMBER 2020
SCALE: 1"=30'
SHEET: 2 OF 2

C2.0

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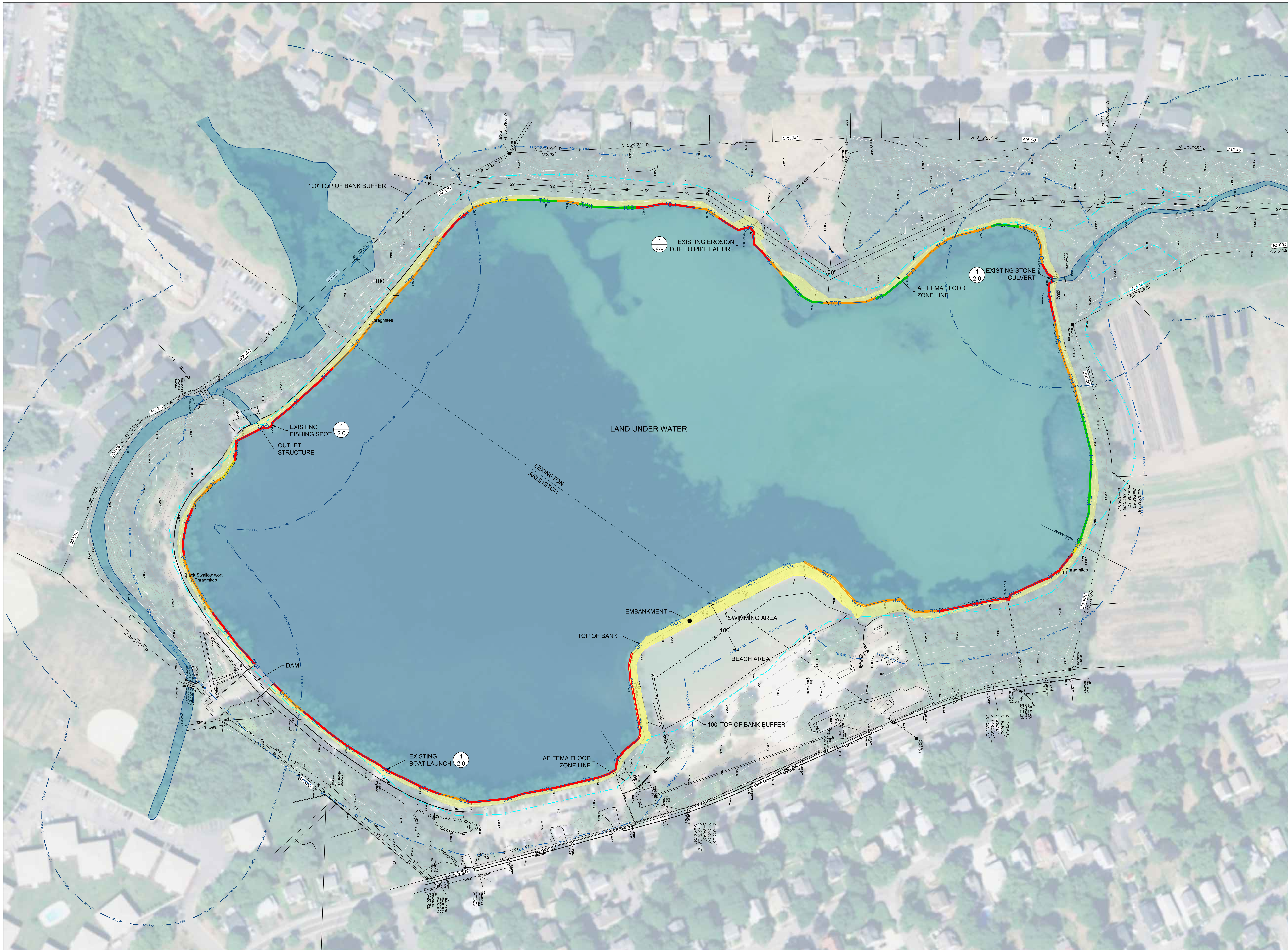

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

LEGEND

- PROPERTY LINES
- EX. MAJOR CONTOUR (5' INTERVAL)
- EX. MINOR CONTOUR (1' INTERVAL)
- TOP OF BANK
- 100' TOP OF BANK BUFFER
- 200' RIVERFRONT AREA
- AREA 'A' BANK RESTORATION: > 12" VERTICAL BANK CUT - ACTION PROPOSED
- AREA 'B' BANK RESTORATION: < 12" VERTICAL BANK CUT - ACTION PROPOSED
- AREA 'C' BANK RESTORATION: STABLE SLOPE - REVEGETATION PROPOSED
- AREA 'D' BANK RESTORATION: STABLE SLOPE - NO ACTION PROPOSED
- AE FLOOD ZONE: 1% ANNUAL CHANCE OF FLOODING, WITH BASE FLOOD ELEVATION
- EMBANKMENT
- SIGNIFICANT INVASIVE POPULATION AREA

ANSI D (22"x34") SCALE: 1"=80'
TABLOID (11"x17") SCALE: 1"=160'

0 40 80 160

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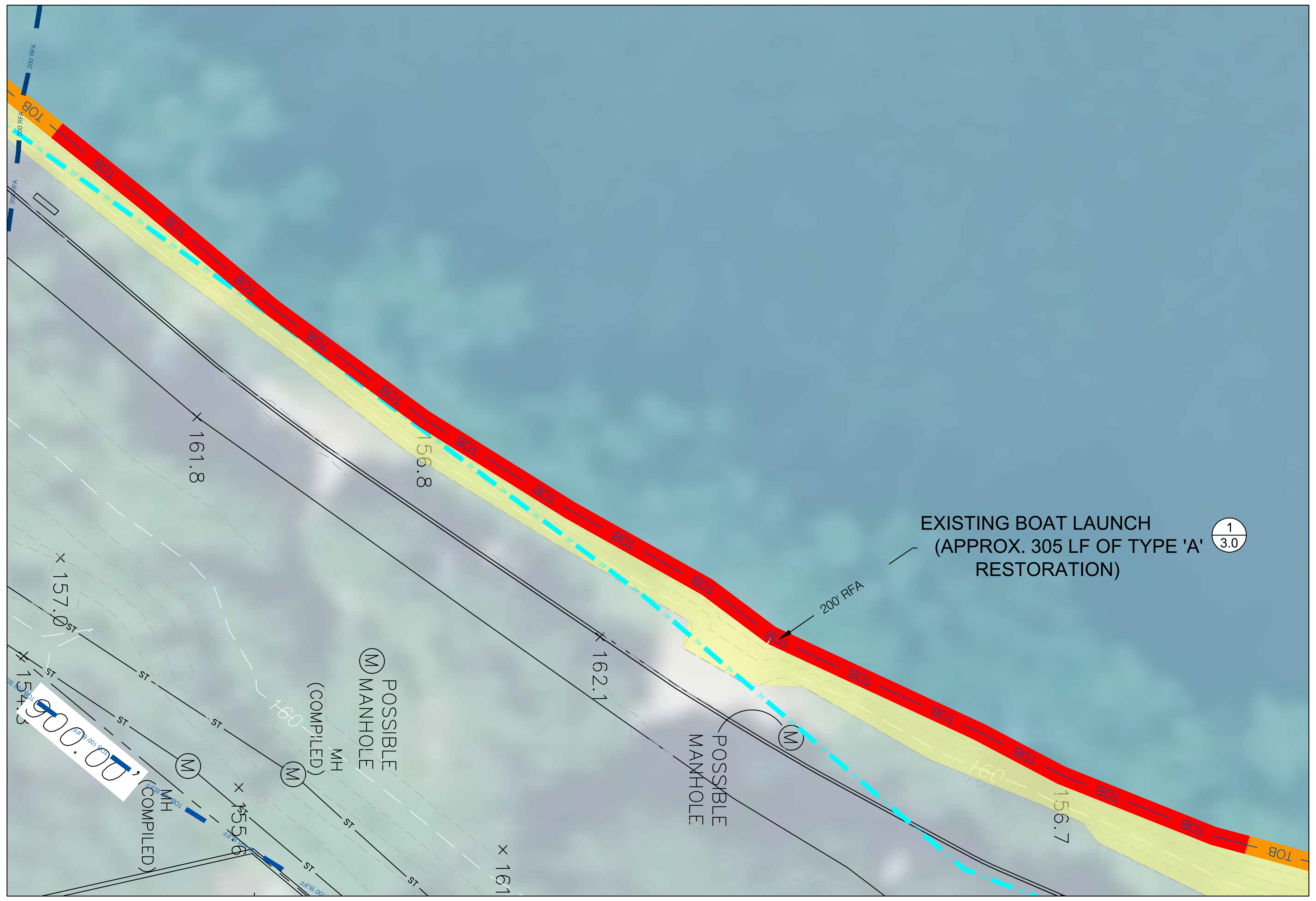
DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: TS Checked By: MM
Date: SEPTEMBER 29, 2020
Scale:
Drawing Title:

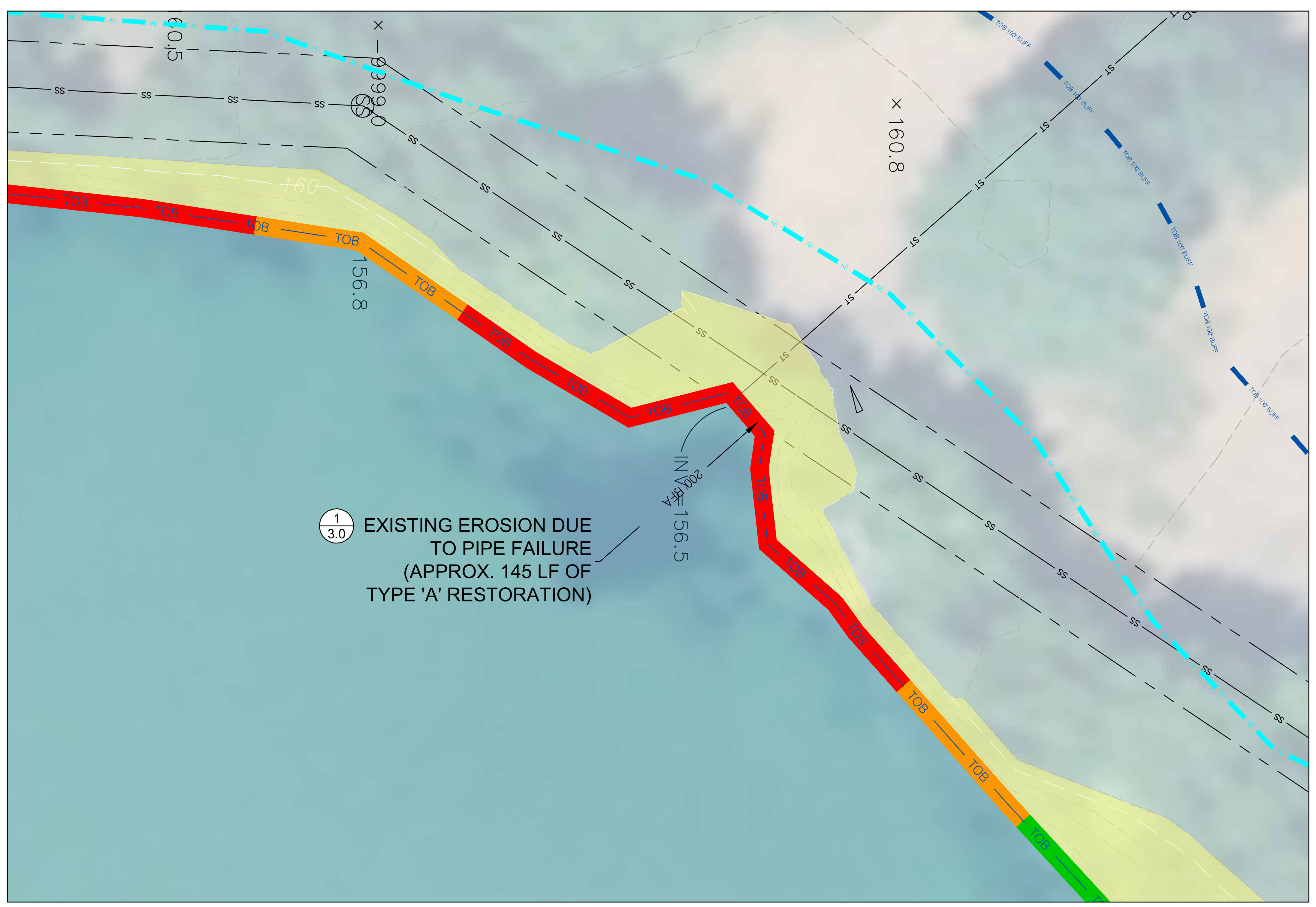
PROPOSED BANK RESTORATION AREAS

1.0



1 PHASE 1 AREA OF CONCERN: EXISTING BOAT LAUNCH
Scale: 1" = 20'

2 PHASE 1 AREA OF CONCERN: EXISTING FISHING SPOT
Scale: 1" = 20'



3 PHASE 1 AREA OF CONCERN: EXISTING EROSION DUE TO PIPE FAILURE
Scale: 1" = 20'

1 PHASE 1 AREA OF CONCERN: EXISTING BOAT LAUNCH
Scale: 1" = 20'

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

LEGEND

- PROPERTY LINES
- EX. MAJOR CONTOUR (5' INTERVAL)
- EX. MINOR CONTOUR (1' INTERVAL)
- TOP OF BANK
- 100' TOP OF BANK BUFFER
- AREA 'A' BANK RESTORATION: > 12" VERTICAL BANK CUT - ACTION PROPOSED
- AREA 'B' BANK RESTORATION: < 12" VERTICAL BANK CUT - ACTION PROPOSED
- AREA 'C' BANK RESTORATION: STABLE SLOPE - REVEGETATION PROPOSED
- AREA 'D' BANK RESTORATION: STABLE SLOPE - NO ACTION PROPOSED
- AE FLOOD ZONE: 1% ANNUAL CHANCE OF FLOODING, WITH BASE FLOOD ELEVATION
- EMBANKMENT
- SIGNIFICANT INVASIVE POPULATION AREA

ANSI D (22"x34") SCALE: 1"=20'
TABLOID (11"x17") SCALE: 1"=40'

0 10 20 40

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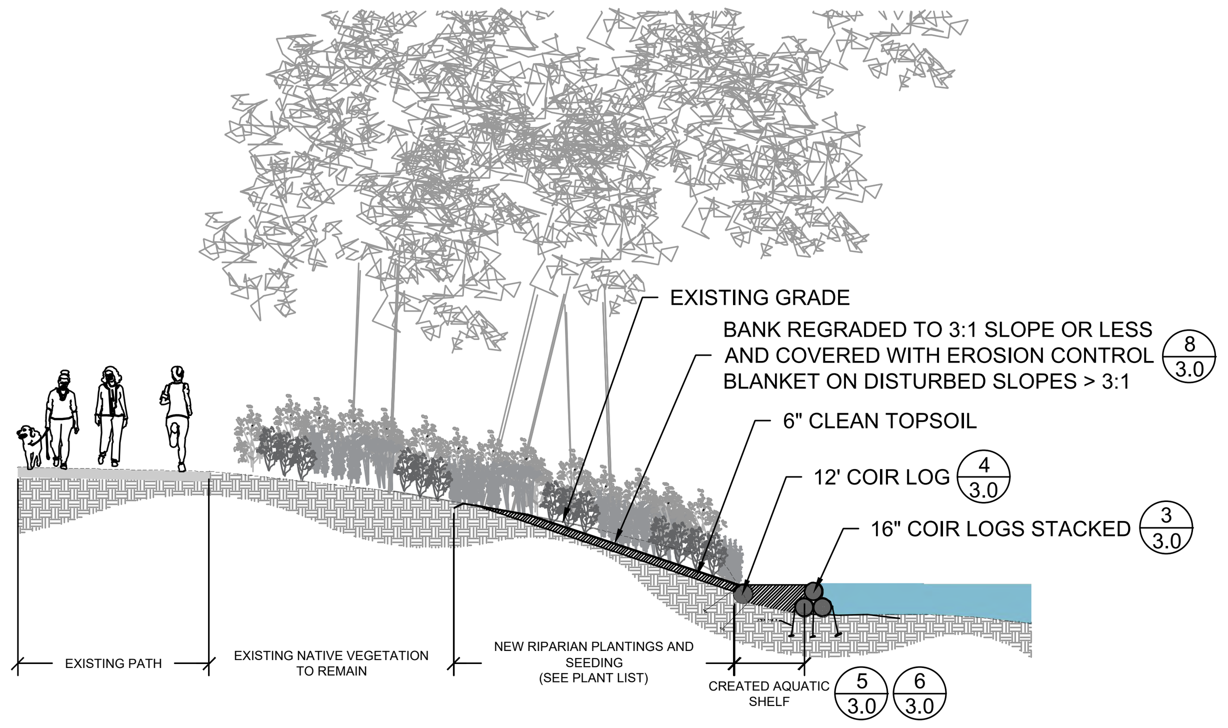
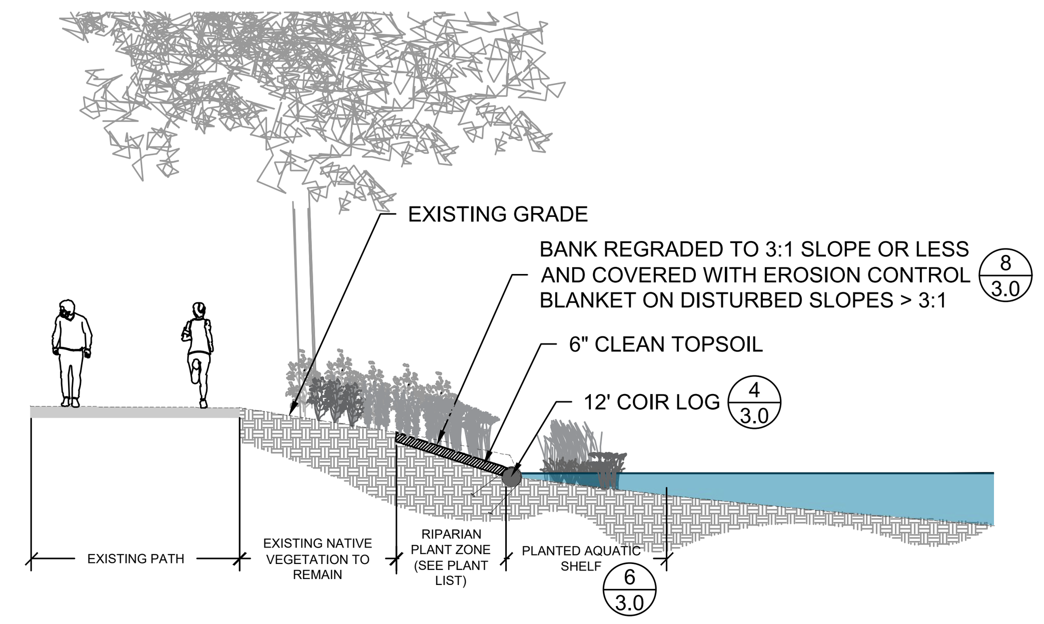
PROPOSED AREAS OF PHASE 1 BANK RESTORATION

2.0



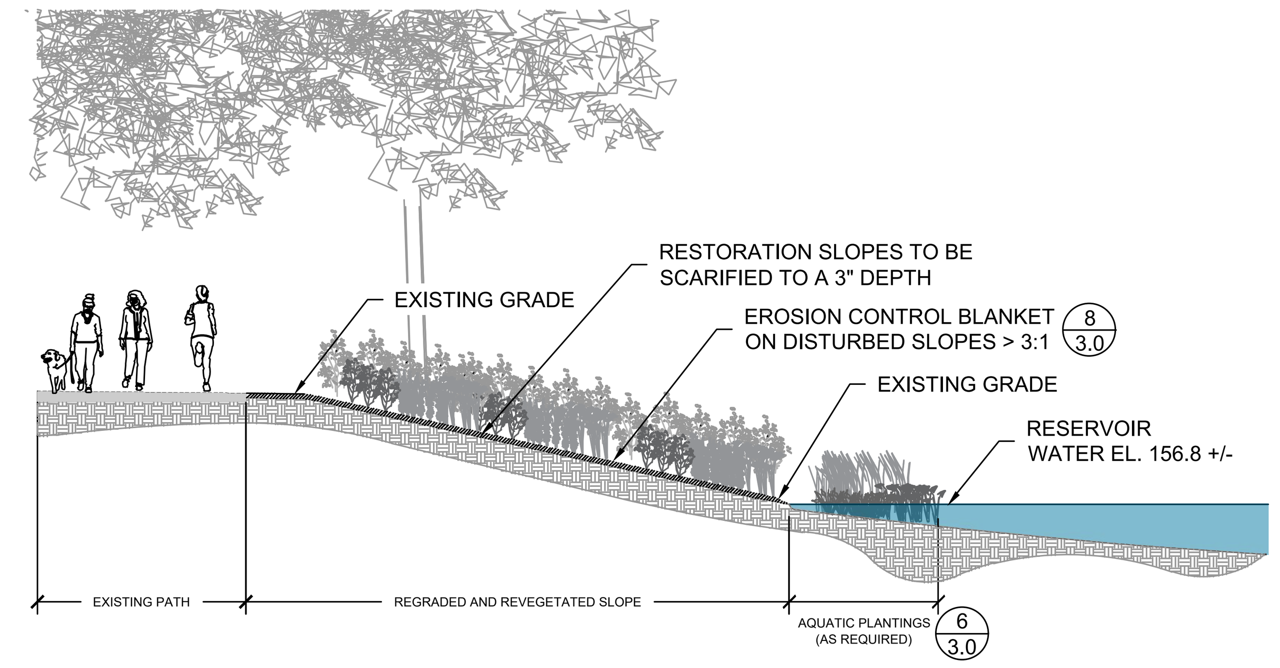
1 AREA 'A' BANK RESTORATION: > 12" VERTICAL BANK CUT (TYP.)

Scale: NTS



2 AREA 'B' BANK RESTORATION: < 12" VERTICAL BANK CUT (TYP.)

Scale: NTS



3 AREA 'C' BANK RESTORATION: STABLE SLOPE - REVEGETATION (TYP.)

Scale: NTS

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

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DESIGN DEVELOPMENT SET

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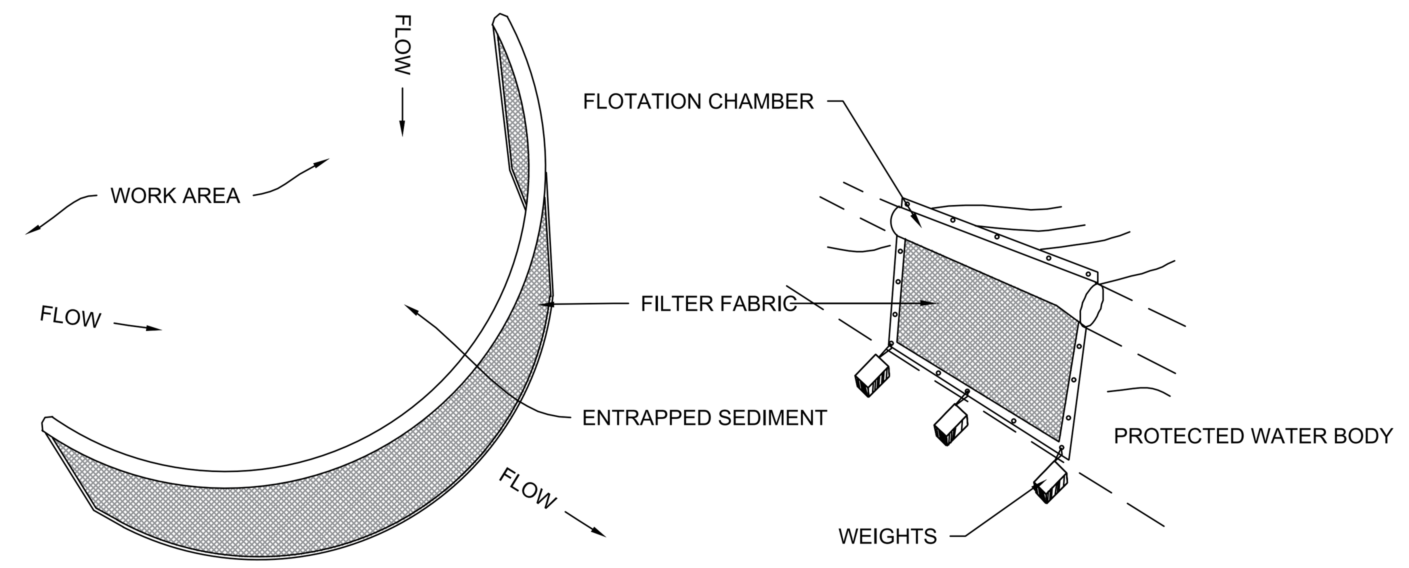
Date: SEPTEMBER 29, 2020

Scale:

Drawing Title:

BANK RESTORATION SECTIONS

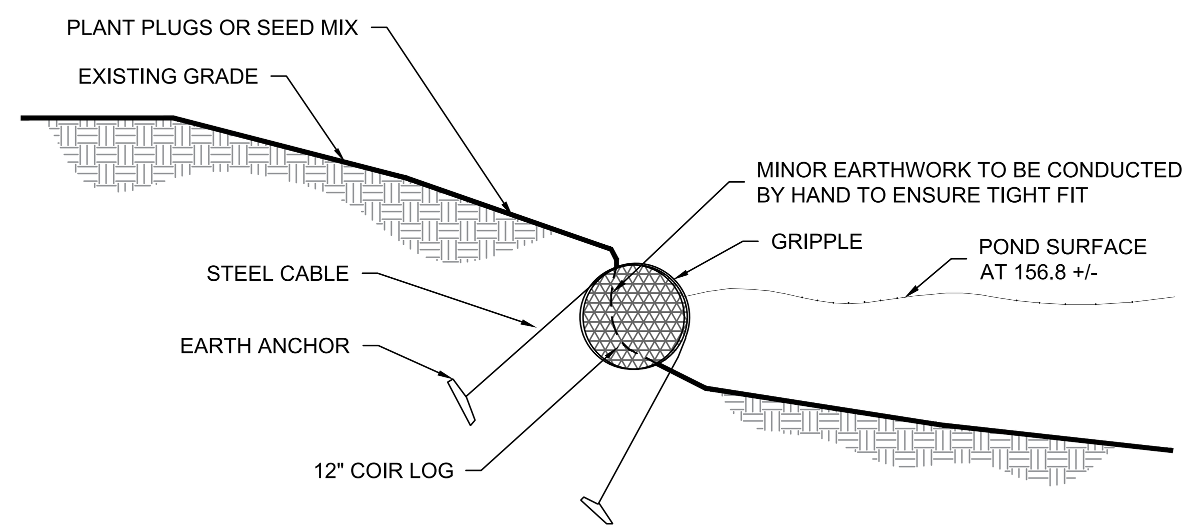
3.0



NOTE: TURBIDITY CURTAIN TO BE TEMPORARILY INSTALLED SURROUNDING ANY BANK OR BOAT RAMP WORK WHICH WILL DISTURB SOILS NEXT TO OPEN WATER. ONCE SUSPENDED SEDIMENT HAS CLEARED, THE TURBIDITY CURTAIN MAY BE REMOVED.

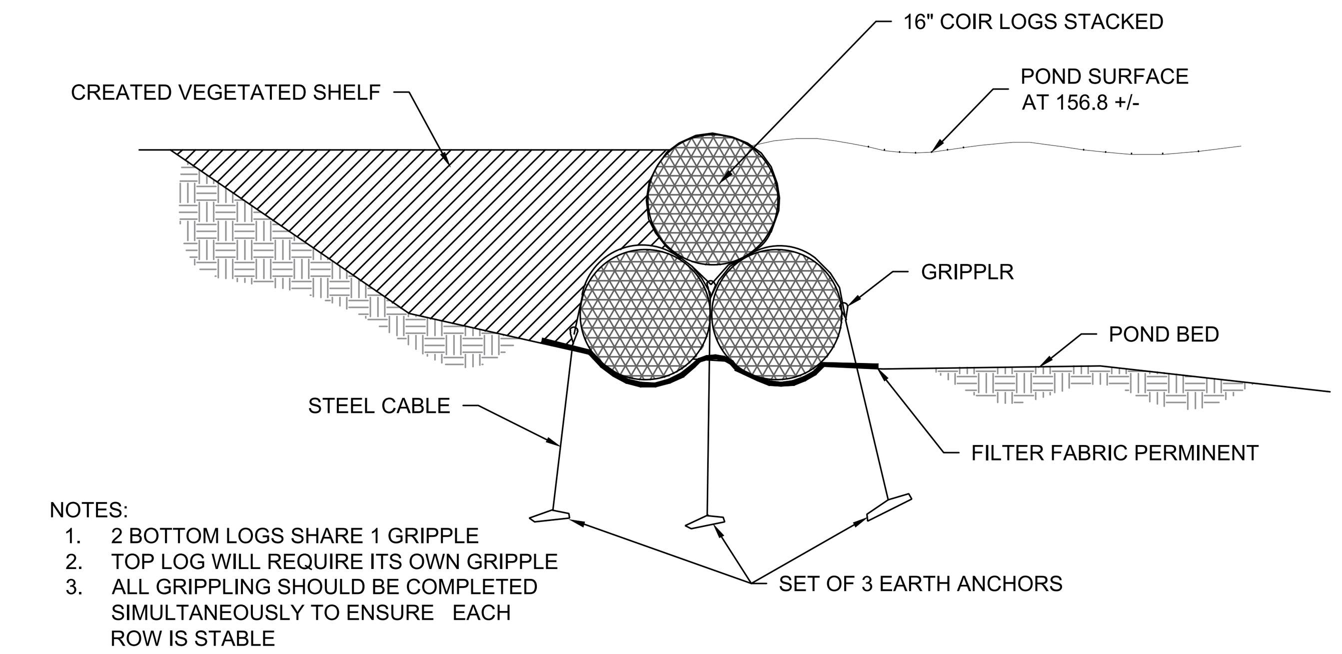
1 TURBIDITY CURTAIN DETAIL FOR IN-WATER SEDIMENT CONTROL (TYP.)

Scale: NTS



2 COIR FASCINE INSTALLATION (TYP.)

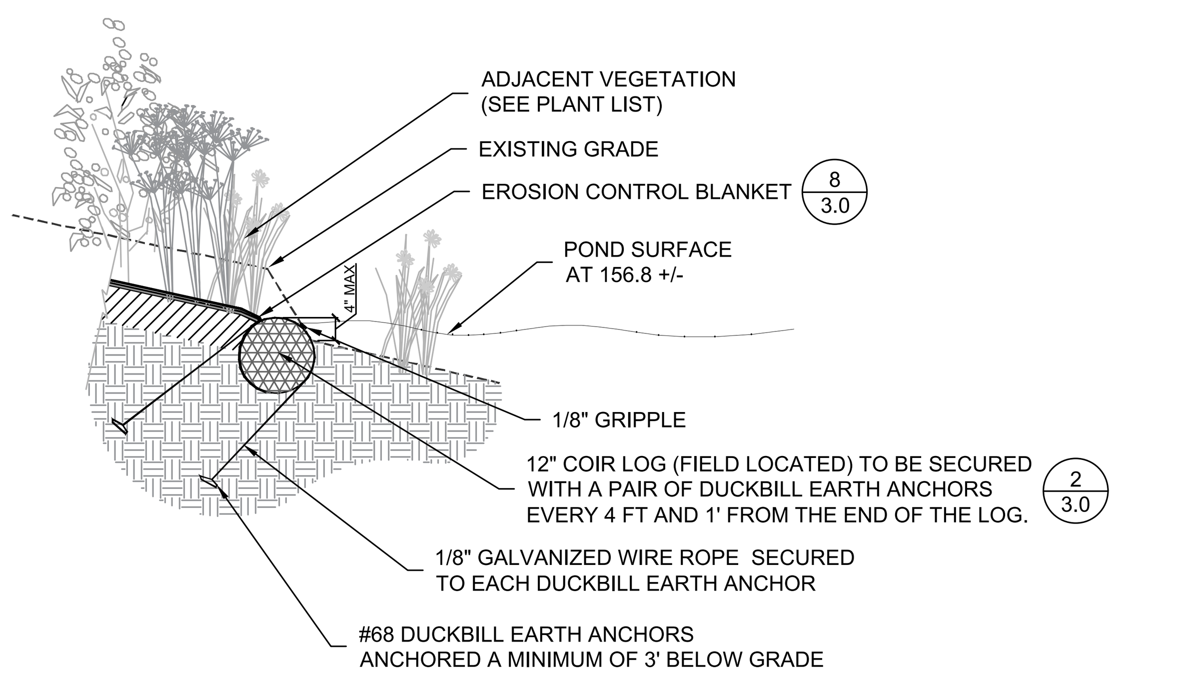
Scale: NTS



NOTES:
1. 2 BOTTOM LOGS SHARE 1 GRIPPLE
2. TOP LOG WILL REQUIRE ITS OWN GRIPPLE
3. ALL GRIPPLING SHOULD BE COMPLETED SIMULTANEOUSLY TO ENSURE EACH ROW IS STABLE

3 COIR FASCINE INSTALLATION FOR BERM (TYP.)

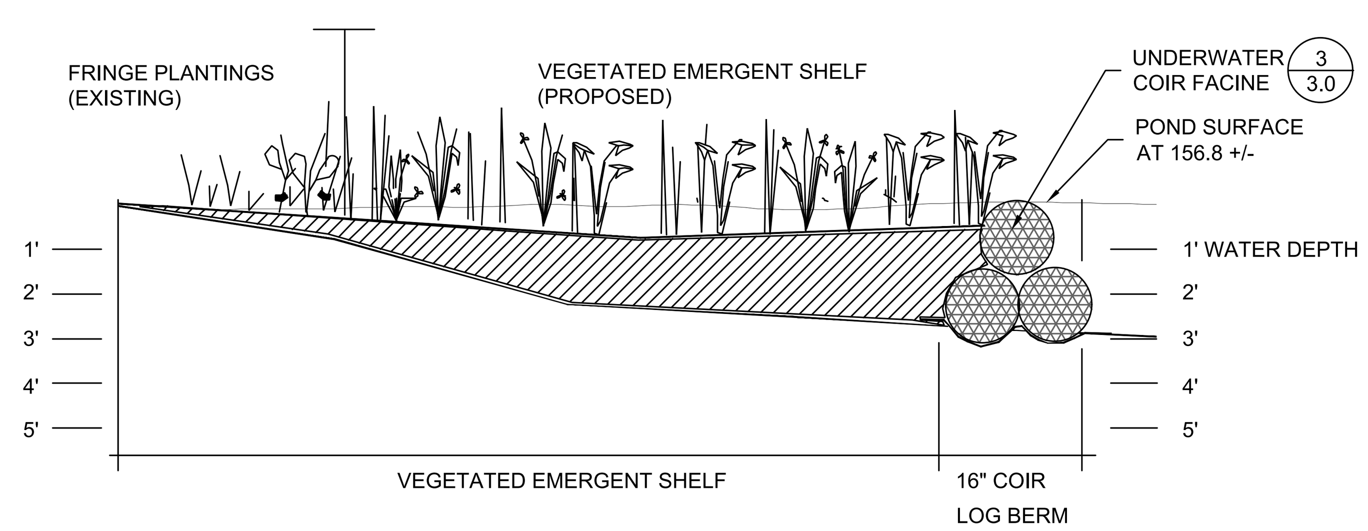
Scale: NTS



NOTES:
1. LOOP A 1/8" ZINC COATED WIRE THROUGH THE LOOP ENDS OF EACH DUCKBILL EARTH ANCHOR AND USE A 1/8" GRIPPLE WIRE TO SECURE THE LOOP. TIGHTEN GRIPPLE LOOP TO ENSURE A TIGHT FIT.
2. COIR LOGS MAY BE STACKED ON TOP OF EACH OTHER IN AREAS WITH A VERTICAL ERODED FACE OF OVER 2'-0" AS DIRECTED BY THE PROJECT DESIGNER.

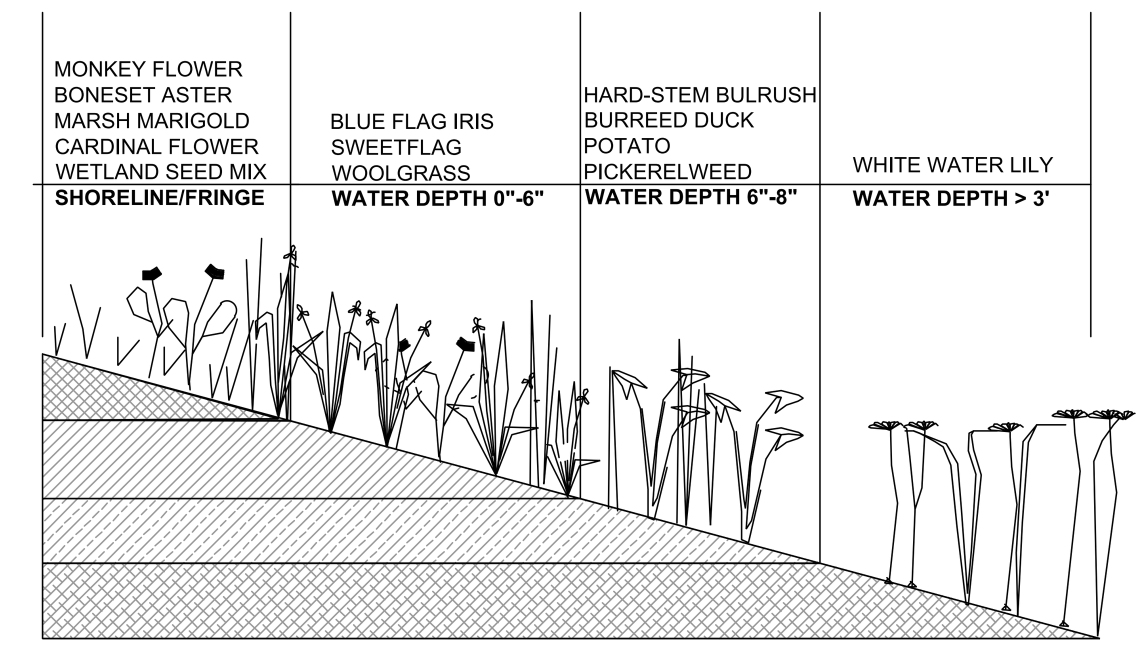
4 COIR LOG INSTALLATION (TYP.)

Scale: NTS



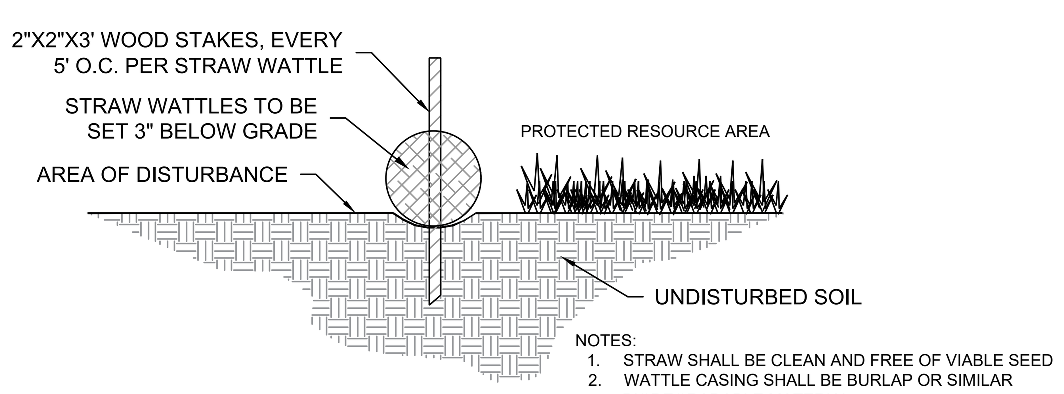
5 EMERGENT SHELF (TYP.)

Scale: NTS



6 EMERGENT SHELF PLANTING ZONES (TYP.)

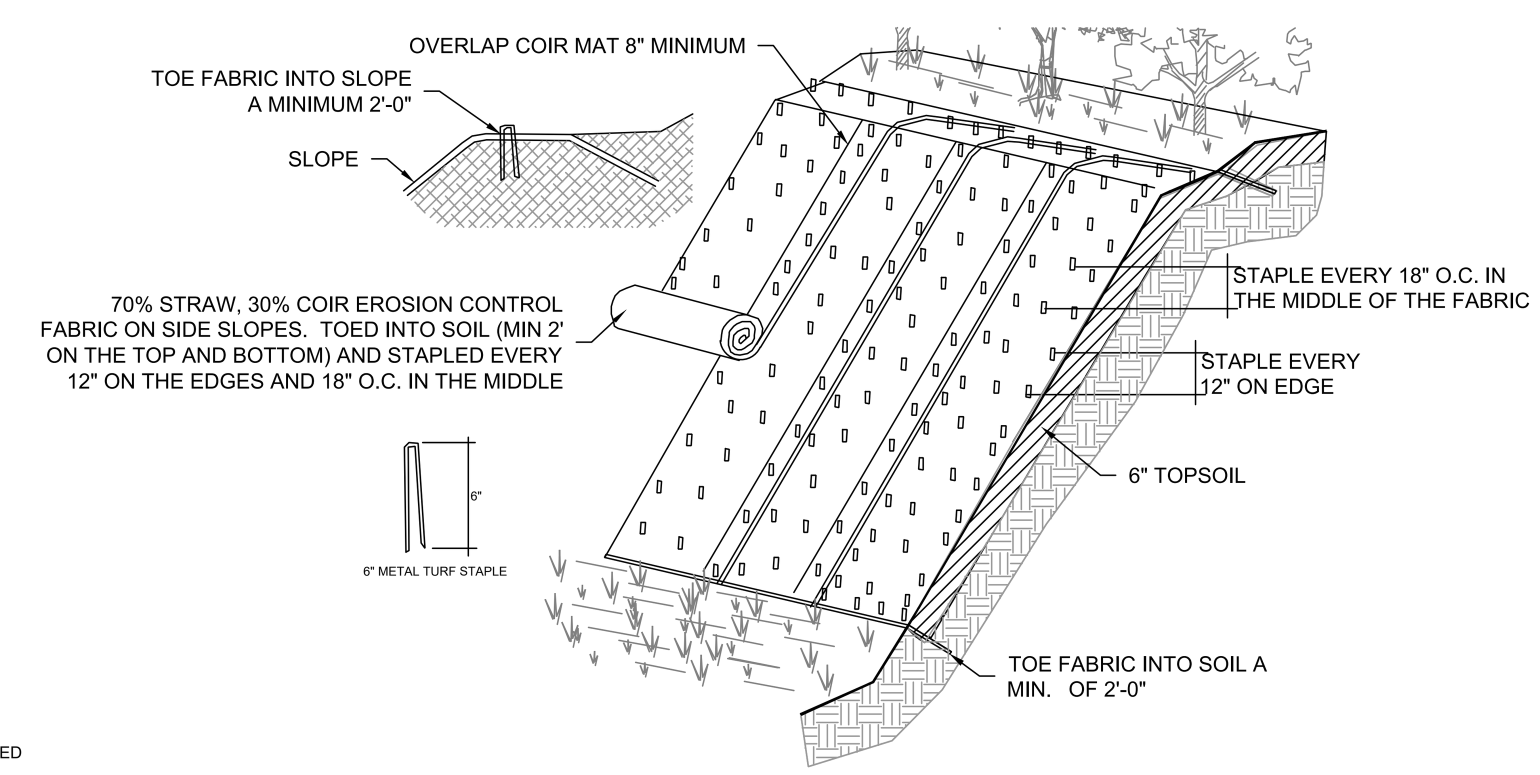
Scale: NTS



NOTES:
1. STRAW SHALL BE CLEAN AND FREE OF VIABLE SEED
2. WATTLE CASING SHALL BE BURLAP OR SIMILAR BIODEGRADABLE MATERIAL

7 STRAW WATTLE EROSION CONTROL

Scale: NTS



EROSION CONTROL FABRIC NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS TO ENSURE THAT THE EROSION CONTROL FABRIC WILL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING EROSION CONTROL FABRIC.
3. LAY FABRIC LOOSELY AND STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. STAPLE FABRIC WITH 6" STAPLES. STAPLE FABRIC EVERY 12" ON SIDES, TOP AND BOTTOM. 18" O.C. IN THE MIDDLE OF THE FABRIC. (PER MANUFACTURES SPECIFICATIONS)
5. THE EROSION CONTROL FABRIC TO BE INSTALLED IN SECTIONS RUNNING FROM THE TOP TO THE BOTTOM OF THE SLOPE, ALONG THE ENTIRE AREAS AS SHOWN ON THE PLAN (PER MANUFACTURES SPECIFICATIONS)
6. EROSION CONTROL FABRIC SHALL USE BIODEGRADABLE (NON-PLASTIC) NETTING
7. TO BE USED ONLY IN AREAS OF TEMPORARY SOIL DISTURBANCE ON SLOPES ADJACENT TO THE POND.
8. FLAT SURFACES SHALL RECEIVE STRAW MULCH APPLIED TO THE GROUND SURFACE AT A RATE OF 2,500 LBS./ACRE.

8 BIODEGRADABLE EROSION CONTROL FABRIC SLOPE STABILIZATION DETAIL

Scale: NTS

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

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DESIGN DEVELOPMENT SET

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Date: SEPTEMBER 29, 2020
Scale:
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BANK RESTORATION DETAILS

4.0

EROSION CONTROL PLAN AND CONSTRUCTION SEQUENCING

EROSION AND SEDIMENT CONTROL METHODS FOR THE PROJECT INCLUDE STRUCTURAL AND STABILIZATION PRACTICES. STRUCTURAL PRACTICES INVOLVE THE CONSTRUCTION OF DEVICES TO DIVERT AND LIMIT RUNOFF. STABILIZATION PRACTICES WILL BE IMPLEMENTED TO COVER EXPOSED SOIL SO THAT DISCHARGE OF SEDIMENT IS MINIMIZED. AN ADEQUATE STOCKPILE OF EROSION CONTROL MATERIALS WILL BE MAINTAINED AT THE PROJECT SITE IN THE EVENT OF AN EMERGENCY OR ROUTINE REPAIR.

TO FURTHER MINIMIZE SEDIMENT LOSS ON THE SITE, A GENERAL CONSTRUCTION SEQUENCE PLAN HAS BEEN DEVELOPED. THE FOLLOWING ARE PROCEDURES TO BE FOLLOWED:

1. ALL VEHICLES AND EQUIPMENT BROUGHT TO THE PROJECT SITE SHALL BE CLEAN AND FREE OF INVASIVE PLANT MATERIAL.
2. THE WETLAND SPECIALIST SHALL MARK OUT RESOURCE BOUNDARIES IN IMPACT/RESTORATION AREAS IN THE FIELD PRIOR TO CONSTRUCTION.
3. PRIOR TO ANY SITE GRADING OR SITE WORK, THE CONTRACTOR SHALL INSTALL ALL SEDIMENT AND EROSION CONTROLS AS SHOWN ON THE RESTORATION PLAN, PLUS ANY ADDITIONAL CONTROLS REQUESTED BY THE WETLAND SPECIALIST BASED ON SITE CONDITIONS TO PREVENT SEDIMENT FROM LEAVING THE SITE OR FURTHER ENCROACHING INTO WETLANDS AND THE RESERVOIR.
4. THE CONTRACTOR FOREMAN SHALL BE DESIGNATED AS THE ON-SITE INDIVIDUAL RESPONSIBLE FOR THE DAILY MONITORING AND MAINTENANCE OF ALL SEDIMENT AND EROSION CONTROLS. ANY BREACH OR FAILURE IN SEDIMENT CONTROLS SHALL BE IMMEDIATELY REPAIRED OR REPLACED. SEDIMENT BUILD-UP BEHIND ANY EROSION CONTROL BARRIER SHALL BE REMOVED WHENEVER SEDIMENT HAS ACCUMULATED TO 3-INCHES IN DEPTH.
5. THE CONTRACTOR SHALL INCORPORATE PERMANENT EROSION CONTROL FEATURES, PERMANENT SLOPE STABILIZATION, AND VEGETATION INTO THE PROJECT PLANS AT THE EARLIEST PRACTICAL TIME TO MINIMIZE THE NEED FOR TEMPORARY CONTROLS.
6. ANY AREA DISTURBED WITHIN THE LIMIT OF BANK WORK IS TO BE SEEDED WITH NEW ENGLAND SEMI-SHADE GRASS AND FORBS SEED MIX UNLESS SPECIFIED OTHERWISE IN THE PLANTING PLAN. THE GROUND SURFACE SHALL BE SCARIFIED PRIOR TO SEEDING. AFTER SEEDING, STRAW MULCH SHALL BE APPLIED TO THE GROUND SURFACE AT A RATE OF 2,500 LBS./ACRE. SEEDED AND/OR PLANTED SLOPES GREATER THAN 3:1 SHALL BE COVERED WITH A BIODEGRADABLE EROSION CONTROL BLANKET SPECIFIED IN THE PLANS.
7. THE CONTRACTOR SHALL MAINTAIN TEMPORARY EROSION AND SEDIMENTATION CONTROL SYSTEMS IN GOOD CONDITION UNTIL THE SITE IS STABLE, AS VERIFIED BY THE WETLAND SPECIALIST. ONCE THE SITE IS STABLE, THE SEDIMENT AND EROSION CONTROLS MAY BE REMOVED UNDER THE DIRECTION OF THE WETLAND SPECIALIST.
8. SHOULD ANY EROSION CONTROL BLANKET BE UTILIZED, THEY SHALL BE COMPRISED OF NON-SYNTHETIC MATERIALS (E.G., JUTE MATTING). NO EROSION CONTROL BLANKETS COMPOSED OF PLASTIC-BASED MATERIALS SHALL BE USED.

BANK RESTORATION NOTES

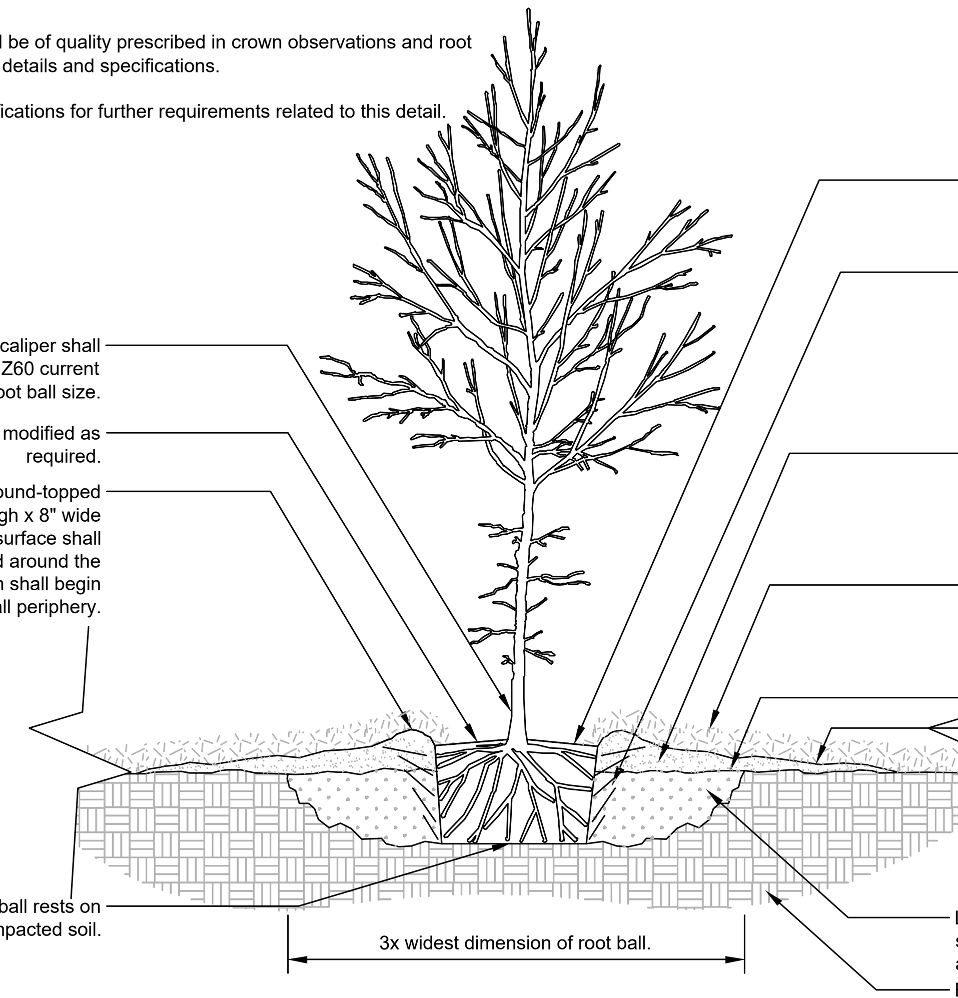
9. THE PURPOSE OF THIS RESTORATION PLAN IS TO IMPROVE BANK STABILITY OF ARLINGTON RESERVOIR BY REDUCING AND CONTROLLING SEDIMENTATION, RESTORING ERODED BANKS, AND ERADICATING NUISANCE VEGETATION.
10. THIS RESTORATION PLAN INCLUDES THREE ACTION OPTIONS DEPENDING ON THE EXTENT OF EXISTING EROSION CONDITIONS OBSERVED IN THE FIELD. BANK RESTORATION OPTIONS ADDRESS ONE OF THREE CONDITIONS A) VERTICAL BANK EROSION GREATER THAN 12 INCHES IN HEIGHT FROM THE WATER LINE, B) VERTICAL BANK EROSION LESS THAN 12 INCHES IN HEIGHT FROM THE WATER LINE, AND C) STABLE BANK EDGES WITH SLOPES DENUDED OF VEGETATION. AREAS INDICATED AS D) WERE OBSERVED TO BE STABLE AND SUFFICIENTLY VEGETATED AND REQUIRE NO ACTION.
11. ERODED PORTIONS OF POND EDGES ARE TO BE RESTORED WITH 12" BIODEGRADABLE COIR LOGS. COIR LOGS WILL BE INSTALLED BY HAND AND ASSOCIATED MINOR EARTHWORK WILL ALSO BE COMPLETED BY HAND OR WITH LIGHT MACHINERY. AREA OF RESERVOIR EDGES IMMEDIATELY UPGRADIENT OF COIR LOGS TO BE REVEGETATED AS NEEDED.
12. INVASIVE RIPARIAN AND AQUATIC WEEDS AND NUISANCE VEGETATION ARE TO BE REMOVED. REMOVAL TO BE CONDUCTED BY "HYDRO-RAKE" AND CHEMICAL TREATMENTS.
13. A FRIABLE "PLANTING BED" CONSISTENCY SHALL BE PREPARED. ANY COMPACTION CAUSED BY EXCAVATION SHALL BE ALLEVIATED.
14. THE RESTORATION AREAS ARE TO BE PLANTED WITH NATIVE WOODY SPECIES, THEN SEEDED WITH NATIVE SEED. (SEE PLANT LIST). PLANT SUBSTITUTIONS DUE TO COMMERCIAL AVAILABILITY OR HYDROLOGIC CONDITIONS MUST BE APPROVED BY THE WETLAND SPECIALIST.
15. THE EROSION CONTROL BARRIER BETWEEN THE RESERVOIR AND RESTORATION AREAS SHALL BE REMOVED UPON STABILIZATION OF THE RESTORATION AREAS AND THE AREA RAKED TO ELIMINATE ANY BERM THAT MAY BE PRESENT BETWEEN THE RESOURCE RESTORATION AREAS AND THE ADJACENT BVW OR RESERVOIR. ANY BARE SOIL THAT RESULTS FROM THE REMOVAL OF THE EROSION CONTROLS SHALL BE SEEDED WITH THE SPECIFIED SEED MIX. ALL STAKES AND TWINE SHALL BE REMOVED.

SEEDING GUIDANCE

16. SEED METHODOLOGY: THE FOLLOWING METHODOLOGY PROVIDES SEQUENCING FOR ESTABLISHING THE SEED MIXES PRESCRIBED ON IN THE PLANS. THIS PROCESS SHOULD BEGIN FOLLOWING FINAL GRADING. THIS METHODOLOGY DOES NOT SPECIFY A TEMPORARY COVER CROP. A COVER CROP MAY BE NEEDED TO STABILIZE THE SITE DEPENDING ON WEATHER CONDITIONS AND CONSTRUCTION TIMING RELATIVE TO THE SEASONS AND THE IDEAL TIME FRAME FOR ESTABLISHING THE SEEDED AREAS. THE BEST TIME TO SEED FOR THIS PROJECT IS IN THE SPRING WHEN THE SOILS ARE AT A NORMAL MOISTURE CONTENT LEVEL (MOIST, NOT SATURATED) AND NO LATER THAN JUNE 30. WEATHER FORECASTS SHOULD BE MONITORED AS OCCASIONAL WATERING MAY BE NECESSARY IF A DRY SPRING SEASON OCCURS. THE SEEDING SEQUENCE SHOULD BEGIN NO LONGER THAN 48 HOURS AFTER FINAL GRADING. SITE STABILIZATION TECHNIQUES SHOULD BE UTILIZED IN THIS 48-HOUR TIME PERIOD.
17. SOIL SCARIFICATION/ SEED BED PREPARATION: SEED BED PREPARATION IS THE PROCESS OF SCARIFYING AND LOOSENING THE SOIL SURFACE TO CREATE A LOOSE, FRIABLE, SOIL SURFACE. THE SOIL SURFACE SHOULD BE A UNIFORM PLANAR SURFACE THAT IS FLAT AND WITHOUT EXCESSIVE RIDGES, FURROWS, RUTS OR MOUNDS AND LOW SPOTS WHERE WATER CAN COLLECT. SOIL SCARIFICATION SHOULD ONLY OCCUR WHEN WEATHER, SOIL CONDITIONS, AND CONSTRUCTION PHASING ALLOWS FOR NO LONGER THAN 48 HOURS BETWEEN SCARIFICATION (THE BEGINNING OF THE SEEDING PROCESS) AND COVERING THE SEED WITH WEED FREE STRAW MULCH (NOT HAY), OR EROSION CONTROL BLANKET. THE SOIL SHOULD BE SCARIFIED TO MAXIMUM DEPTH OF 3 INCHES (SEE BELOW). DURING THIS PROCESS, AREAS WHERE COARSE GRAVEL DOMINATES THE SOIL SURFACE SHOULD BE IDENTIFIED AND AMENDED WITH FINE SANDY-SOIL COMMON BORROW GENERATED FROM ON-SITE EARTHWORK. THE IMPORTATION OF TOPSOIL SHOULD BE A LAST RESORT AND ONLY USED AS AN AMENDMENT FOR “LOCALIZED” SPOTS THAT LACK THE CHARACTERISTICS OF A SOIL SEED BED.
18. SEED APPLICATION: A WELL-PREPARED SEED BED PROVIDES A LOOSE FRIABLE SOIL SURFACE FOR WHICH THE SEED CAN BE SOWN INTO. SEED APPLICATION IS A TWO-PART PROCESS: 1) SEED APPLICATION AT PROPER RATES PER ACRE AND 2) SOW THE SEED INTO THE SOIL ¼ TO ½” DEPTH MAXIMUM. APPROPRIATE SEED RATES FOR EACH PRESCRIBED SEED MIX ARE SPECIFIED ON THE ACCOMPANYING DETAILS SHEET.
    a. SEEDING BY HAND: CHECK THE SEED LABEL PRIOR TO OPENING THE BULK BAG TO CONFIRM THE CORRECT SEED IS BEING APPLIED TO THE SPECIFIED LOCATION. THE BULK BAGS OF SEED SHOULD BE AGITATED BY HAND ON SITE TO REDISTRIBUTE THE SEEDS IN THE MATRIX BEFORE SPREADING. IN BARE AREAS A WEED FREE STRAW MULCH MAY BE USED TO COVER THE SOIL SURFACE FOLLOWING THE SEED APPLICATION.
    b. SOWING THE SEED: ONCE THE SEED IS SPREAD THE SEED MUST BE SOWN INTO THE SOIL TO THE DEPTH ABOVE TO INCREASE CHANCES OF GERMINATION BY KEEPING SOIL MOISTURE CLOSE TO THE SEED. THE SEED CAN BE SOWN BY A NUMBER OF WAYS INCLUDING “TRACKED” IN WITH A LOW PSI RUBBER TIRE OR TRACKED MACHINE, USING A YORK LANDSCAPE RAKE OR SIMILAR, OR THE TRADITIONAL MEANS OF USING A METAL LEAF RAKE.
19. RESEEDING: AREAS TO BE RESEEDED SHALL FOLLOW THE SAME SEEDING SEQUENCE OUTLINED ABOVE. IT IS EXPECTED THAT SOME SEEDED AREAS MAY NOT GERMINATE, BUT THAT OVER TIME THE PLANTED AREAS SHALL FILL IN THROUGH SEED PROLIFERATION AND GROWTH HABITS. AREAS LARGE ENOUGH TO BE IDENTIFIED THROUGH MONITORING AS BEING DOMINATED BY WEEDS OR OTHER INVASIVE SPECIES THAT HAVE OUT COMPETED THE SPECIFIED SEED MIX OR AREAS DEEMED UNSTABLE DUE TO LOW PLANT GROWTH SHALL BE RESEEDED ACCORDINGLY.
20. PLANT SUCCESSION NOTES: IT IS POSSIBLE THAT OVER TIME SOME SEEDED AREAS MIGHT BECOME DOMINATED BY NATIVE PLANT SPECIES EXISTING IN THE SOIL SEED BANK. ONE EXAMPLE OF THIS IS THE LIKELIHOOD THAT VARIOUS TYPES OF NATIVE FERNS COULD EMERGE IN SHADED AREAS. NO SPECIES OF FERNS ARE IN THE PRESCRIBED SEED MIX BUT ARE HIGHLY DESIRABLE SPECIES THAT CAN EXIST AND THRIVE IN THE IDENTIFIED PLANTING AREAS ADDING TO LANDSCAPE DIVERSITY. NATIVE SPECIES SUCH AS FERNS THAT EMERGE DUE TO BEING IN THE SOIL SEED BANK SHOULD REMAIN. THOROUGH AND REGULAR MONITORING DURING THE MATURATION OF THE ESTABLISHMENT AREAS IS A KEY COMPONENT TO BALANCING AREAS TO BE RESEEDED AND AREAS WHERE SUCCESSIONAL PLANT GROWTH OF NATIVES SHOULD BE ALLOWED TO THRIVE.

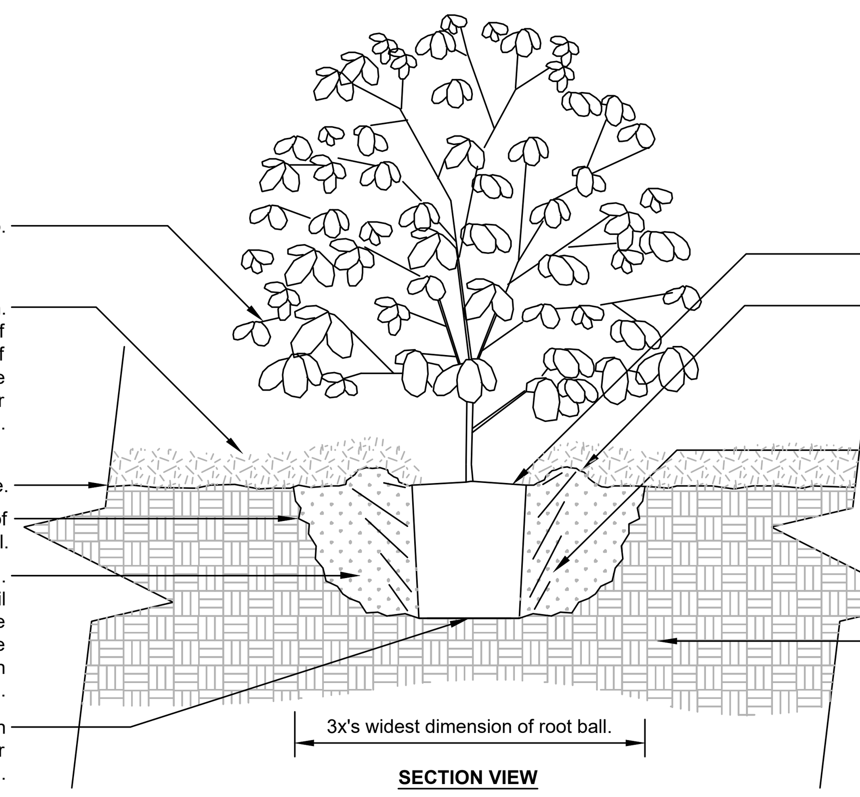
Notes:
1- Trees shall be of quality prescribed in crown observations and root observations details and specifications.

2- See specifications for further requirements related to this detail.



1 TREE PLANTING DETAIL

Scale: NTS

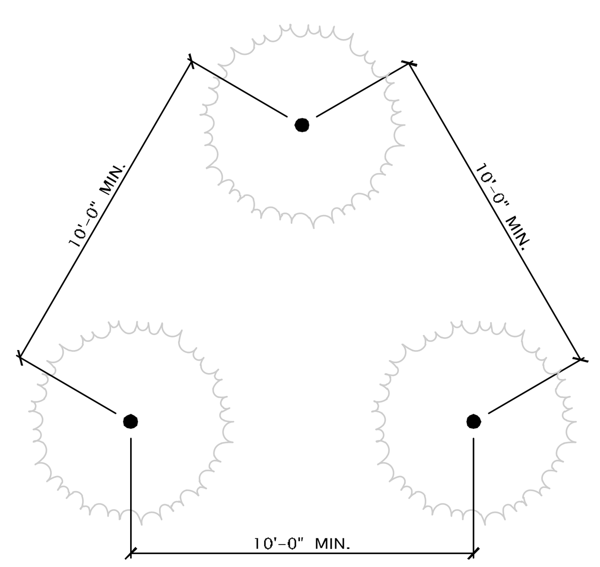


Notes:
1- Shrubs shall be of quality prescribed in the root observations detail and specifications.

2- See specifications for further requirements related to this detail.

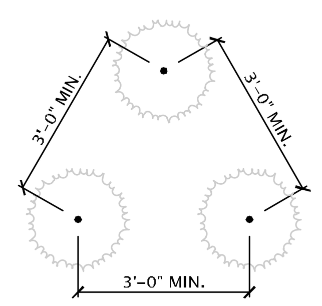
2 SHRUB PLANTING DETAIL

Scale: NTS



3 TREE SPACING (TYP.)

Scale: NTS



4 SCRUB SPACING (TYP.)

Scale: NTS

New England Semi-Shade Grass and Forbs Mix

Botanical Name	Common Name	Indicator
Elymus virginicus	Virginia Wild Rye	FACW-
Elymus canadensis	Canada Wild Rye	FACU+
Festuca rubra	Red Fescue	FACU
Chamaecrista fasciculata	Partridge Pea	FACU
Liatris spicata	Spiked Gayfeather/Marsh Blazing Star	FAC+
Onoclea sensibilis	Sensitive Fern	FACW
Aster prenanthoides (Symphyotrichum prenanthoide)	Zigzag Aster	FAC
Eupatorium fistulosum (Eutrochium fistulosum)	Hollow-Stem Joe Pye Weed	FACW
Eupatorium perfoliatum	Boneset	FACW
Juncus tenuis	Path Rush	FAC

Apply: 30 lbs/acre

5 NEW ENGLAND SEMI-SHADE GRASS AND FORBS MIX

Scale: NTS Source: Seed mixes referenced herein are provided by New England Wetland Plants, Inc.

PLANT RESTORATION SCHEDULE

Cover Type	Abbrev.	Scientific Name	Common Name	Plant Size @ Installation	Area 'A'	Area 'B'	Area 'C'	Area 'D'
			Total Enhancement Area (lf)		2,120	1,650	130	680
			Total Enhancement Area Approx. (sf)		31,800	24,750	1,950	10,200
Trees								
	Ar	*Acer rubrum*	Red Maple	4'-6' ht. min.	--	9	3	--
	Ba	*Betula alleghaniensis*	Yellow Birch	4'-6' ht. min.	--	9		--
	Bp	*Betula populifolia*	Grey Birch	4'-6' ht. min.	--	9		--
	Ns	*Nyssa sylvatica*	Black Gum	4'-6' ht. min.	--	9	3	--
	Pd	*Populus deltoides*	Cottonwood	4'-6' ht. min.	--	9		--
	Qr	*Quercus rubra*	Red Oak	4'-6' ht. min.	--	9	3	--
	Sd	*Salix discolor*	Pussywillow	4'-6' ht. min.	--	9	3	--
	Sn	*Salix nigra*	Black Willow	4'-6' ht. min.	--	9	3	--
Shrubs								
	Ca	*Clethra alnifolia*	Sweet Pepperbush	3'-4' ht. min.	50	27	6	--
	Cs	*Cornus sericea*	Red Osier Dogwood	3'-4' ht. min.	50	27	6	--
	Iv	*Ilex verticillata*	Winterberry	3'-4' ht. min.	50	27	6	--
	Vd	*Viburnum dentatum*	Northern Arrowwood	3'-4' ht. min.	50	27	6	--
Herbacious								
- Shoreline/Fringe	Cp	*Caltha palustris*	Marsh Marigold	2" plug	2,100	1,800	150	--
	Ep	*Eupatorium perfoliatum*	Boneset Aster	2" plug	2,100	1,800	150	--
	Mr	*Mimulus ringens*	Monkey Flower	2" plug	2,100	1,800	150	--
- Water Depth 0"-6"	Am	*Acorus americana*	Sweetflag	2" plug	2,100	1,800	150	--
	Lc	*Lobelia cardinalis*	Cardinal Flower	2" plug	2,100	1,800	150	--
	Iv	*Iris versicolor*	Blue Flag Iris	2" plug	2,100	1,800	150	--
- Water Depth 6"-8"	Pc	*Pontederia cordata*	Pickerelweed	2" plug	1,350	1,050	450	--
	Sa	*Schoenoplectus acutus*	Hard-stem Bulrush	2" plug	1,350	1,050	450	--
	Sc	*Scirpus cyperinus*	Woolgrass	2" plug	1,350	1,050	450	--
	Sl	*Sagittaria latifolia*	Duck Potato	2" plug	1,350	1,050	450	--
	Sm	*Sparganium americanum*	Burreed	2" plug	1,350	1,050	450	--
- Water Depth > 3'	No	*Nymphaea odorata*	White Water Lily	tuber		5,220	5,850	--
Seed Mix								
	New England Erosion Control/Restoration Mix For Detention Basins and Moist Sites (Lbs)			18lbs/acre	13.0	11.0	1.0	--

Tree quantities specified are based off the USDA New England Forest: Baseline for New England Forest Health Monitoring report.
Trees shall be installed not less than 10 feet on center and no farther than 12 feet on center.
Shrubs shall be planted in clusters of 2 or 3, and shall be installed not less than 3 feet on center.
Areas within planting areas not 100% vegetated with existing herbaceous plants will be seeded with the appropriate seed mix at the manufacturers specified rate to cover the bare area.
A wetland scientist or landscape architect shall provide supervision of the plant layout.
Plant substitutions may be necessary due to commercial availability. Substitutions shall be approved by the supervising wetland scientist or landscape architect.
Invasive species control semi-annually for the first two-years
Area A woody material assumes 50% slope coverage of upland areas based on the USDA New England Forest prescribed rate of 240 trees per acre and 75% shrub cover at the prescribed spacing above
Area B woody material assumes 50% slope coverage of upland areas based on the USDA New England Forest prescribed rate of 240 trees per acre and 75% shrub cover at the prescribed spacing above
Area C woody material assumes 25% slope coverage of upland areas based on the USDA New England Forest prescribed rate of 240 trees per acre and 75% shrub cover at the prescribed spacing above
Fringe and aquadic vegetation assumes an average of 3 square feet of planting area per linear foot at 12-inch on center spacing for each community

6 PLANT SCHEDULE

Scale: NTS

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE

SWCA ENVIRONMENTAL CONSULTANTS

SWCA ENVIRONMENTAL CONSULTANTS
15 RESEARCH DRIVE
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Kyle Zick Landscape Architecture, Inc.
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DESIGN DEVELOPMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: TS Checked By: MM
Date: SEPTEMBER 29, 2020
Scale:
Drawing Title:

BANK RESTORATION DETAILS AND NOTES

5.0

STORMWATER MANAGEMENT REPORT

Arlington Reservoir – Phase 2

40 Shattuck Road | Suite 110
Andover, Massachusetts 01810
800.426.4262

woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

0233115.00
Town of Arlington
Massachusetts
October 2020

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APPENDICES

1. PROJECT DESCRIPTION

1.1 Introduction

On behalf of the Town of Arlington, Massachusetts (the Town), Woodard & Curran, Inc. (Woodard & Curran) has prepared this Stormwater Management Report for the proposed improvements to the Arlington Reservoir, located at 210 Lowell Street in Arlington, Massachusetts (the Site). The Town is proposing to revitalize the eastern shore of the Arlington Reservoir recreation area. Weston & Sampson Engineers, Inc. (Weston and Sampson), on behalf of the Town of Arlington, developed a Master Plan for the Reservoir in 2018. This proposed project encompasses Phase 2 of the Master Plan and improvements include installing porous pavement over the approximately 0.5-acre gravel parking area in the southern portion of the site, installation of new ADA-accessible pathways, a new play area, a multi-use court, a boat launch, and several other Site improvements as shown on the Post-Development Watershed Figure located in **Appendix C**. The impacts of these improvements to the Site's stormwater drainage patterns are summarized in this report.

1.2 Existing Conditions

A Site Locus Plan on a United States Geological Survey (USGS) Quadrangle Map depicting the project location has been provided in **Appendix A**. Arlington Reservoir is a 65-acre man-made recreational and stormwater-control pond on the Arlington and Lexington Town border. About half of the reservoir's open water is located in the Town of Lexington, however, the Town of Arlington owns and manages the reservoir. The earthen dam around the southern edge of the Reservoir is approximately 600 yards long and up to 14 feet tall. The water within the Reservoir discharges into Mill Brook through a sluice gate.

In 1935, the Town of Arlington constructed a sandy beach on the Reservoir's eastern shore. In the late 1970s, the Town completed improvements to the beach and added an embankment to separate the swimming area from the rest of the Reservoir. The beach now includes a filtered, chlorinated swimming area with a ramp for ADA accessibility, a bathhouse, vending machines, a concession area, and a playground. The Reservoir also has a one-mile walking trail around its perimeter, open to the public throughout the year.

1.2.1 Land Cover and Soils

Land cover and soils datasets were used to develop hydrologic curve numbers. Land cover was determined by a site visit conducted on September 3, 2020 and review of aerial photography and site survey data. A more detailed examination of the existing land cover within individual drainage subcatchments can be found in section 2.2.2. All existing impervious areas located within the Town of Lexington that are proposed to be replaced with a pervious land cover are required to be considered open space in good condition for stormwater calculations purposes per Lexington's Stormwater Management Regulations.

Soil characteristics were observed during test pit evaluations conducted in August 2020 and supplemented with information obtained from the United States Department of Agriculture's (USDA's) most recent Web Soil Survey. A Site map showing soil types and hydrologic soil group classifications within the project vicinity from the USDA's Web Soil Survey is located in **Appendix B**.

Test pits were conducted by Civil Design Consultants, Inc. (CDCI) of Methuen, Massachusetts on August 6, 2020 to evaluate the subsurface soil conditions and identify the estimated seasonal high groundwater table elevation. In all four borings conducted, CDCI observed a surface layer of fill ranging from 9 to 27 inches in depth, followed by a sandy loam layer extending to the bottom of each test pit. From these test pits, it was determined that at its highest elevation in the 0.5-acre parking lot, the seasonal high groundwater table is located approximately at elevation 159.40. Woodard & Curran used this data to locate the proposed stormwater best management practices (BMPs) at elevations with at

least two feet of separation from groundwater. Bedrock was not encountered during test pitting activities. The test pit logs and location figure provided by CDCI are located in **Appendix B**.

1.2.2 Topography

Subcatchment boundaries were delineated using the site survey performed and prepared by Weston & Sampson in December 2017. Topographically, the eastern shore of the Reservoir generally slopes downward from Lowell Street towards the Reservoir, with the exception of the southern-most portion of the 0.5-acre gravel parking area, which slopes downwards towards a ditch just north of the property located at 202 Lowell Street.

In both the pre- and post-development Site conditions, stormwater travels across the Site via overland flow and discharges into one of three Design Points: Arlington Reservoir, the on-Site swimming area, and the ditch located north of 202 Lowell Street. The Design Points and contributing areas are further described in Section 2.2.1. and are depicted in the Pre- and Post-Development Watershed Figures in **Appendix C**.

1.2.3 Resource and Critical Areas

Woodard & Curran reviewed Massachusetts Geographic Information System (MassGIS) data, the Massachusetts Department of Environmental Protection's (MassDEP's) Habitat of Potential Regional and Statewide Importance maps, the Massachusetts Stormwater Handbook, the Massachusetts Year 2016 Integrated List of Waters, and the Federal Emergency Management Agency's (FEMA's) National Flood Hazard Layer (NFHL) database. The findings of our review are below:

- The Massachusetts Endangered Species Act (MESA) protects rare species and their habitats by prohibiting the taking of any plant or animal species listed as Endangered, Threatened, or Special Concern by the Massachusetts Division of Fisheries & Wildlife. MESA review is required by the Natural Heritage & Endangered Species Program (NHESP) for projects and activities located within a Priority or Estimated Habitat of Rare Species. Review of the MassGIS Data shows there are no Priority or Estimated Habitats within the Project Area; therefore, the project is not subject to MESA review.
- Per MassGIS Data, there are no Certified or Potential Vernal Pools within or near the project area.
- Per MassGIS Data, the project is not located within any Areas of Critical Environmental Concern.
- Per the MassDEP's Habitat of Potential Regional and Statewide Importance maps for the Towns of Arlington and Lexington, the project in not located within a Habitat of Regional or Statewide Importance.
- Per the Massachusetts Stormwater Handbook, critical areas include Outstanding Resource Waters and Special Resource Waters, recharge areas for public water supplies, bathing beaches, cold-water fisheries, and shellfish growing areas. Review of MassGIS Data indicated that the Arlington Reservoir is not located within a resource area, however, the Swimming Area on the eastern shore of the Reservoir is classified as a bathing beach, as defined in 105 CMR 445, and thus a critical area.
- Per the Massachusetts Year 2016 Integrated List of Waters, Mill Brook, which receives discharges from Arlington Reservoir via a sluice gate on the southern portion of the Reservoir, is classified as a Category 5 water, meaning the waterbody requires a Total Maximum Daily Load (TMDL) restriction. Mill Brook's impairment of concern is Escherichia Coli (E. Coli). Proposed site improvements are not likely to increase E. Coli levels in Arlington Reservoir, and thus contributing to Mill Brook's impairment.

- Per FEMA's NFHL database, the majority of the Site is located within an area of minimal flood hazard (Zone X). The Reservoir's shoreline and the isolated swimming area are located within special flood hazard areas (Zone AE). The FEMA NFHL FIRMette Map is located in **Appendix A**.

Measures taken to address the presence of a critical area on-Site are detailed in Section 3.6. Critical areas have specific stormwater analysis guidelines, requiring the use of certain pollution prevention measures and BMPs to the maximum extent practicable for redevelopment projects.

1.3 Proposed Project Work

The proposed project consists of paving the approximately 0.5-acre gravel parking area in the southern portion of the site, renovation of the existing bathhouse and concessions building, installation of new ADA-accessible concrete pathways, lifeguard stands, picnic tables, a playground, multi-use court, boat launch, check-in shelter, and several other surficial Site improvements. Construction activities are expected to begin in March 2021 and end in November 2021.

2. STORMWATER EVALUATION

2.1 Stormwater Modeling Methodology

TR-55/TR-20 methodology was used to develop a hydrologic model of the site. Woodard & Curran used the computer program entitled HydroCAD Version 10.0, developed by HydroCAD Software Solutions, LLC in order to create and analyze the site hydrology. The analysis was conducted in order to establish the peak rates of runoff and estimated runoff volume from the project site. This was accomplished to evaluate pre- and post-development conditions during various storm events. Contributing drainage areas were identified and soils, surface cover, watershed slope, and flow paths were evaluated to develop the necessary HydroCAD model input parameters. A minimum Time of Concentration (Tc) of 6 minutes was used in the calculations, as applicable.

Drainage calculations were performed for the pre- and post-development conditions for the 1-, 2-, 10-, 25-, and 100-year 24-hour Type III storm events, and are included in **Appendix D**, in accordance with the Town of Arlington's, Town of Lexington's, and the Massachusetts Department of Environmental Protection's Stormwater Management Regulations. The total rainfall for each of the storm events was based upon data published by the Northeast Regional Climate Center (NRCC) and Natural Resources Conservation Service (NRCS) entitled *Extreme Precipitation in New York and New England* found at http://precip.eas.cornell.edu/. The total precipitation depth for the project site associated with each rainfall event is outlined in **Table 2-1**, below.

Table 2-1: Design Rainfall Data

Type III 24-Hour Storm Event (Frequency)	Rainfall Depth (Inches)
1-Year	2.67
2-Year	3.21
10-Year	4.86
25-Year	6.17
100-Year	8.85

A copy of the NRCC and NRCS Extreme Precipitation Table for the project Site is included in **Appendix A**.

2.2 Hydraulic Model Description

A stormwater model has been developed to compare the peak runoff rates from the pre-development site to the peak runoff rates anticipated from the post-development site. As further described herein, the model demonstrates that the post-development runoff rates will not exceed pre-development rates.

2.2.1 Design Points

Existing and proposed subcatchments were delineated in order to compare pre- and post-development peak rates of runoff. Although the size of each subcatchment differs slightly between the existing and proposed site conditions, the total area analyzed between the two conditions remained the same. A Design Point was established for each watershed, symbolizing the area's ultimate stormwater discharge location. For this analysis, two watershed areas were identified, and therefore two Design Points were chosen, as follows:

- Design Point 1 (DP-1): represents runoff discharging to the Arlington Reservoir and Swimming Area.

- Design Point 2 (DP-2): represents runoff discharging to the ditch located north of the property at 202 Lowell Street.

The locations of the Design Points do not differ in the pre- and post-development analyses, as seen in the figures located in **Appendix C**.

2.2.2 Pre-Development Conditions

The pre-development project area consists of a swimming area, sandy beach, bathhouse, vending machines, concession area, playground, pump station building, walking paths, benches, lifeguard stands, a 0.5-acre gravel parking lot, a small paved parking lot, and various other Site features. Existing grassed areas on-Site were modeled to be in "fair" condition, as much of the grassed surfaces are currently covered in beach sand and therefore are not likely infiltrating groundwater as efficiently as grass in "good" condition would be.

Per Article 15 – Storm Water Mitigation of the Town of Arlington's Title V – Regulations Upon the Use of Private Property Bylaws, impervious surfaces are defined as "a hard-surfaced, human-made area that does not readily absorb or retain water, preventing the infiltration of storm water runoff; including but not limited to…parking and driveway areas…" Upon review of existing conditions at the site, it appears the 0.5-acre gravel parking lot on the southern half of the Site exhibits the hydrologic characteristics one would expect with an impervious surface. Ponded water has been observed on the gravel surface several days after rain events due to its inability to infiltrate to the soil below. Based on this review and Article 15 of the Town of Arlington's Title V Bylaws, the gravel parking area has been considered impervious for the purposes of this stormwater analysis.

The pre-development watershed area is approximately 5.42 acres in size. There are no existing stormwater BMPs on-Site; stormwater runoff from the three subcatchments within the project area is conveyed via overland flow to their respective design points, as described below:

- *Subcatchment 1:* Subcatchment 1 encompasses the northern portion of the Site, including the playground, beach, and parking lots. Stormwater runoff from subcatchment 1 flows via overland flow from east to west before discharging into the Arlington Reservoir and Swimming Area (DP-1), which is classified by MassDEP as a critical area. The area is approximately 5.22 acres in size; land cover is primarily comprised of grass, beach sand, surface water, and impervious gravel with smaller areas of brush, impervious structures, and sand pathways. The calculated weighted curve number for this subcatchment is 71.

- *Subcatchment 2:* Subcatchment 2 encompasses the southern-most portion of the 0.5-acre gravel parking area. Stormwater runoff from subcatchment 3 flows via overland flow from north to south before discharging into the ditch just north of the property at 202 Lowell Street (DP-2). The area is approximately 0.20 acre in size; land cover is primarily comprised of impervious gravel, grass, and brush, with smaller areas of impervious surfaces. The calculated weighted curve number for this subcatchment is 64.

The subcatchment areas and their associated design points are illustrated on the Pre-Development Watershed Figure provided in **Appendix C** of this Report.

2.2.3 Post-Development Conditions

The post-development project area will consist of a swimming area, sandy beach, renovated bathhouse, vending machine, and concession area, a newly-paved picnic pavilion and drop-off area, a new check-in area, permeable multi-surface athletic court, playground, lifeguard stands, walking paths, restored grass areas, 21,500 square-foot porous pavement parking lot, and various other Site features. The new walking paths around the project area will be ADA-

accessible and will allow increased Site access not currently provided in the Site's existing condition. The porous pavement parking lot is described in further detail in Section 2.2.4.

Similar to the pre-development model, the post-development watershed area is also 5.42 acres in size. Stormwater runoff from the two subcatchments will flow to its respective design points, as described below:

- *Subcatchment 1:* Subcatchment 1 will encompass the northern portion of the Site, including the playground, beach, and parking lots. Stormwater runoff from subcatchment 1 will flow via overland flow from east to west before either discharging directly into Arlington Reservoir and Swimming Area (DP-1) or into the porous pavement system proposed for installation over the Site's southern parking area. Stormwater entering the porous pavement system will either infiltrate into the ground or, during large storm events, will be collected by the system's underdrain and discharged towards Arlington Reservoir. The subcatchment area will be approximately 5.32 acres in size; land cover will be primarily comprised of grass, surface water, beach sand, porous asphalt pavement, and various impervious surfaces (including standard asphalt pavement, concrete walkways, and structures), with smaller areas of brush, permeable playground and athletic court surfaces, and stone dust. The calculated weighted curve number for this subcatchment is 69.
- *Subcatchment 2:* Subcatchment 2 will encompass the area south of the porous pavement parking area. Stormwater runoff from subcatchment 2 will flow via overland flow from north to south before discharging into the ditch just north of the property at 202 Lowell Street (DP-2). The area will be approximately 0.10 acre in size; land cover will be entirely comprised of grass. The calculated weighted curve number for this subcatchment is 39.

The subcatchment areas and their associated design points are illustrated on the Post-Development Watershed Figure provided in **Appendix D** of this Report.

2.2.4 Low Impact Development Technique – Porous Pavement

Porous pavement was selected as a Low Impact Development (LID) technique for this Site in accordance with the Arlington Reservoir Master Plan written by Weston & Sampson in 2018. The proposed 21,500 square-foot porous pavement parking lot will replace the existing impervious gravel lot, which will provide a stabilized parking area and minimize the amount of maintenance required to upkeep the parking lot and reduce the amount sediment transported into Arlington Reservoir during post-construction conditions. Stormwater directed to the porous pavement will filter through the system's asphalt, choker, and pea gravel courses and enter the reservoir course, designed to provide storage capacity while stormwater infiltrates into the soils beneath the system. The bottom of the reservoir course was designed at elevation 161.40, providing a 2-foot separation from the highest seasonal high groundwater table elevation observed during test pitting activities conducted at the Site. A four-inch PVC underdrain and three grate inlets will be installed within the western-most portion of the system's reservoir course to provide an outlet for stormwater during extreme storm events. The invert of these outlets was designed at the 100-year storm elevation within the porous pavement BMP, meaning rainfall greater than the 100-year storm will flow through the reservoir course of the pavement system to the PVC underdrain and grate inlets and will discharge to the Arlington Reservoir (DP-1).

Volume 1, Chapter 1 of the Massachusetts Stormwater Handbook does not list porous pavement as an approved stormwater BMP for discharges near bathing beaches and Volume 2, Chapter 2 of the Handbook states that porous pavement shall be set back at least 100 feet from surface waters to receive any water quality credit. Existing Site constraints, including the lack of available area to install stormwater BMPs and the proximity to surface water across the entire project area, inhibit the use of many typical BMPs. Although porous pavement is not a listed BMP for bathing beaches, its use can be implemented within the project area and it will improve stormwater treatment at the Site by increasing water quality volume, annual recharge, and removal of total suspended solids (TSS) in the post-development Site condition.

2.3 Peak Discharge Rates and Runoff Volumes

The tables below summarize the pre- and post-development peak discharge rates and runoff volumes for each Design Point.

Table 2-2: Pre- and Post-Development Peak Discharge Rates

Design Point	1-year (cfs)			2-year (cfs)			10-year (cfs)			25-year (cfs)			100-year (cfs)		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP-1	2.96	1.65	**-1.31**	4.93	3.15	**-1.78**	12.11	8.92	**-3.19**	18.53	14.29	**-4.24**	32.53	26.30	**-6.23**
DP-2	0.04	0.00	**-0.04**	0.10	0.00	**-0.10**	0.33	0.00	**-0.33**	0.54	0.02	**-0.52**	1.04	0.13	**-0.91**

Note: Δ stands for net difference between the pre- and post-development rates.

Table 2-3: Pre- and Post-Development Runoff Volumes

Design Point	1-year (af)			2-year (af)			10-year (af)			25-year (af)			100-year (af)		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP-1	0.25	0.17	**-0.08**	0.38	0.27	**-0.11**	0.87	0.66	**-0.21**	1.32	1.03	**-0.29**	2.32	1.87	**-0.45**
DP-2	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.03	0.00	**-0.03**	0.04	0.00	**-0.04**	0.07	0.01	**-0.06**

Note: Δ stands for net difference between the pre- and post-development volumes.

Table 2-2 demonstrates a decrease in peak discharge rates between the existing and proposed site conditions for all scenarios shown above; **Table 2-3** demonstrates a decrease in runoff volumes between the existing and proposed site conditions for all scenarios shown above. Complete copies of the pre- and post-development HydroCAD computer model outputs demonstrating that peak discharge rates and runoff volumes decrease between the existing and proposed Site conditions are included in **Appendix D**.

3. COMPLIANCE WITH STORMWATER MANAGEMENT STANDARDS

Volume 1, Chapter 1 of the Massachusetts Stormwater Handbook states:

> *"For purposes of the Stormwater Management Standards, redevelopment projects are defined to include…maintenance and improvement of existing roadways, including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving."*

By this definition, the Arlington Reservoir Phase 2 project is considered a redevelopment project, meaning certain Standards included in the Massachusetts Stormwater Handbook only need to be met to the maximum extent practicable (as defined by Standard 7). The following sections further detail applicability of these Stormwater Management Standards and demonstrates that the proposed Arlington Reservoir – Phase 2 Project complies with these requirements.

3.1 Standard 1: No New Untreated Discharges

"No new stormwater conveyances (e.g. outfalls) will discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth."

In the existing site condition, stormwater is generally transported via overland flow towards the Arlington Reservoir and Swimming Area (DP-1) and the ditch just north of the property at 202 Lowell Street (DP-2). Runoff from the project area is not currently treated prior to discharge. The proposed site improvements will not create any new untreated stormwater discharges and will result in a net decrease in impervious area of approximately 18,000 square feet. Stormwater runoff from Site will be either conveyed via overland flow to Design Points, similar to existing condition drainage patterns, or will be treated by a new porous pavement system prior to infiltrating into the ground or, during extreme storms greater than the 100-year event, discharging into the Arlington Reservoir (DP-1) after filter treatment. There are no proposed untreated stormwater discharges that will cause erosion in or to wetlands or waters of the Commonwealth. This Standard has been met.

3.2 Standard 2: Peak Rate Attenuation

"Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates."

Calculations are provided to show that the post-development peak discharge rates do not exceed pre-development rates for the 1-, 2-, 10-, 25-, and 100-year 24-hour storm events. A detailed description of both the existing and proposed Site conditions are located in Section 2.2 of this report. Copies of the existing and proposed HydroCAD computer model outputs demonstrating that this standard has been met are included in **Appendix D**.

3.3 Standard 3: Recharge

"Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This condition is met when the stormwater management system is designed to infiltrate the required volume as determined in accordance with the Massachusetts Stormwater Handbook."

The proposed improvements will decrease the amount of impervious area across the project Site by approximately 18,000 square feet. No additional groundwater recharge volume is required, however, installation of porous pavement over the existing gravel parking lot in the southern portion of the Site and restoration of grass areas throughout the Site

are proposed as part of this project. The porous pavement and restored grass areas will increase stormwater infiltration, and therefore annual recharge, in the post-development Site condition.

3.4 Standard 4: Water Quality

"Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when: (a) Suitable practices for source control and pollution prevention are identified in long-term pollution prevention plan, and thereafter implemented and maintained; (b) Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and (c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook."

Existing Site conditions provide 0% TSS removal. The Town of Arlington is proposing to install a porous pavement system over the existing gravel parking lot in the southern portion of the Site. The system will increase water quality volume and remove TSS from the stormwater runoff produced from the proposed parking lot area and the adjacent grass area to the east sloping downward from Lowell Street in the post-development Site condition. During storm events, stormwater will filter through the porous pavement system's asphalt, choker, and pea gravel courses and enter the reservoir course, designed to provide storage capacity while stormwater infiltrates into the soils beneath the system.

According to Volume 2, Chapter 2 of the Massachusetts Stormwater Handbook, porous pavement systems can remove up to 80% of TSS if the reservoir course is designed to hold the Site's required water quality volume and to drain within 72 hours of a storm event. The proposed Site improvements will decrease the amount of impervious area across the project Site by approximately 18,000 square feet, and therefore no additional water quality volume is required on-Site. However, the porous pavement system's reservoir course has been designed to store the 100-year storm event and to drain within 26 hours of the 100-year event. Therefore, it can be assumed that the proposed porous pavement system will remove up to 80% of the TSS in stormwater runoff discharging to the system. On other parts of the proposed project Site, this Standard is met to the maximum extent practicable by not creating any new untreated stormwater discharges.

An Operations and Maintenance Plan is provided in **Appendix E**, which specifies suitable practices for source control and long-term pollution prevention.

3.5 Standard 5: Land Uses with Higher Potential Pollutant Loads

"For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook."

The proposed project is not considered a Land Use with Higher Potential Pollutant Loads; therefore, this standard does not apply.

3.6 Standard 6: Critical Areas

"Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas as provided in the Massachusetts Stormwater Handbook."

Per the Massachusetts Stormwater Handbook, the Arlington Reservoir and associated Swimming Area on the eastern shore of the Reservoir are classified as critical areas. These surface water features are described throughout this report as DP-1 and will receive stormwater discharges from subcatchment 1 in the post-development Site condition. Critical areas have specific stormwater analysis guidelines, requiring the use of certain pollution prevention measures and BMPs to the maximum extent practicable for redevelopment projects. Compliance with these guidelines is discussed below:

- Standard 6 requires BMP trains discharging to critical areas to remove 80% of TSS prior to discharge. There are no existing stormwater BMPs located in subcatchment 1. In the proposed Site condition, the majority of stormwater runoff from subcatchment 1 will travel, via overland flow, to the Reservoir and Swimming Area by passing over grassed areas and beach sand prior to discharging into DP-1. This stormwater runoff will not be treated by a stormwater BMP, similar to existing Site conditions. Stormwater runoff produced from the proposed porous parking lot area and the adjacent grass area to the east sloping downward from Lowell Street will filter through the porous pavement system, during which 80% of TSS will be removed.

- A water quality depth of one-inch (1") must be used for water quality volume calculations in critical areas. The proposed Site improvements will decrease the amount of impervious area across the project Site by approximately 18,000 square feet, and therefore no additional water quality volume is required on-Site.

The proposed Site improvements meet this Standard to the maximum extent practicable.

3.7 Standard 7: Redevelopment

"A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5 and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions."

The proposed project is considered a redevelopment project and will decrease the overall impervious area on Site by approximately 18,000 square feet. The proposed work fully complies with Stormwater Management Standards 1, 2, 3, 5, 8, 9, and 10, and complies, to the maximum extent practicable, with Standards 4 and 6 as described herein.

3.8 Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

"A plan to control construction related impacts including erosion, sedimentation, and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented."

A plan to control construction-related impacts, specifically erosion and sedimentation, has been developed and is included in **Appendix F**. The proposed project has been designed to minimize land disturbance and preserve existing vegetation to the maximum extent practicable. The proposed construction BMPs have been designed in accordance with Massachusetts Erosion and Sediment Control BMPs Handbook published by MassDEP.

The Contractor will be responsible for implementing the specified erosion and sedimentation control methods. These measures will be maintained and kept in place until the disturbed areas of the project have fully stabilized. In addition, a U.S. Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit is required whenever construction activities will disturb one or more acres; the proposed project will disturb approximately 5.42 acres.

3.9 Standard 9: Operation and Maintenance Plan

"A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed."

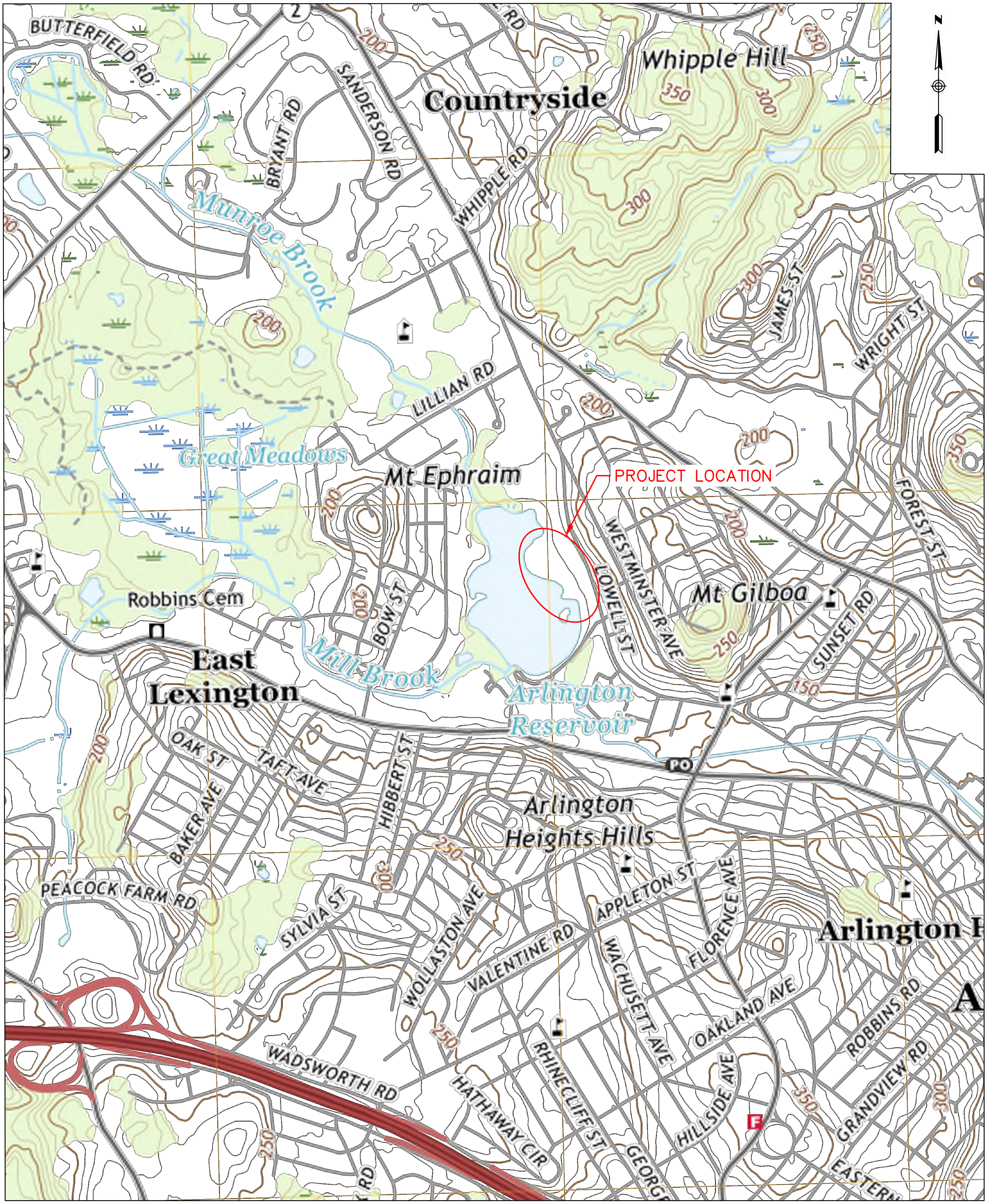
A long-term Operation and Maintenance Plan is included in **Appendix E** of this report.

3.10 Standard 10: Prohibition of Illicit Discharges

Standard 10 states that "All illicit discharges to the stormwater management system are prohibited."

The project will not result in any new illicit discharges. An Illicit Discharge Compliance Statement will be submitted prior to construction.

APPENDIX A: ENVIRONMENTAL RESOURCE DOCUMENTATION



NOTES:

1. BASE MAP TAKEN FROM UNITED STATES GEOLOGICAL SERVICES, DATED 2018. ACCESSED ON SEPTEMBER 15, 2020.

WOODARD & CURRAN 40 Shattuck Road, Suite 110 Andover, Massachusetts 01810 866.702.6371 | www.woodardcurran.com COMMITMENT & INTEGRITY DRIVE RESULTS	ARLINGTON RESERVOIR PHASE 2 LOCUS MAP	TOWN OF ARLINGTON, MA 51 GROVE STREET ARLINGTON, MA 02476	JOB NO: 0233115.00 DATE: SEPTEMBER 2020 SCALE: N.T.S.
	DESIGNED BY: LLT DRAWN BY: LLT	CHECKED BY: BSM 2020.09.15 LOCUS MAP.dwg	
		ARLINGTON RESERVOIR 210 LOWELL ST, ARLINGTON, MA	FIGURE 1

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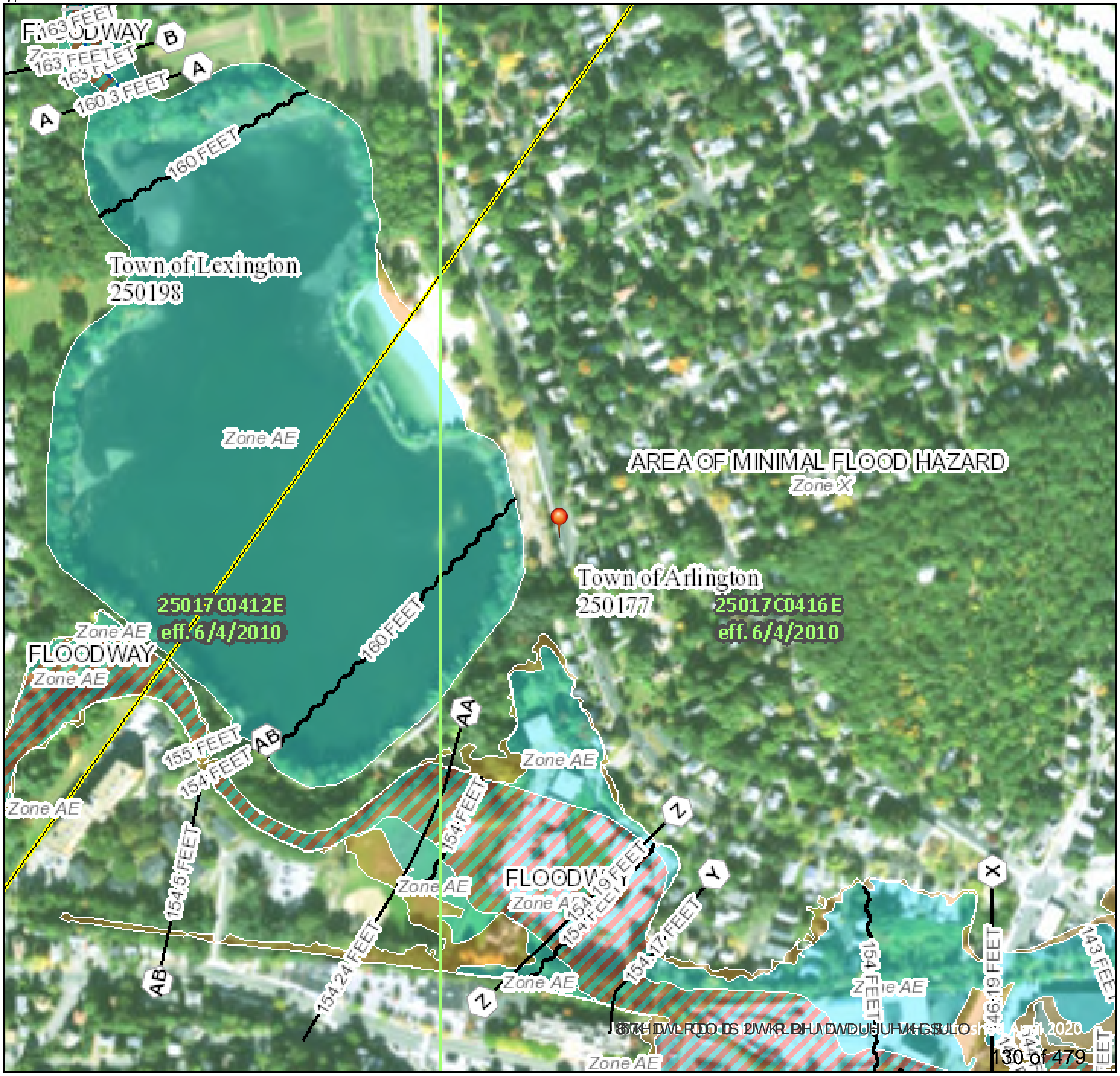

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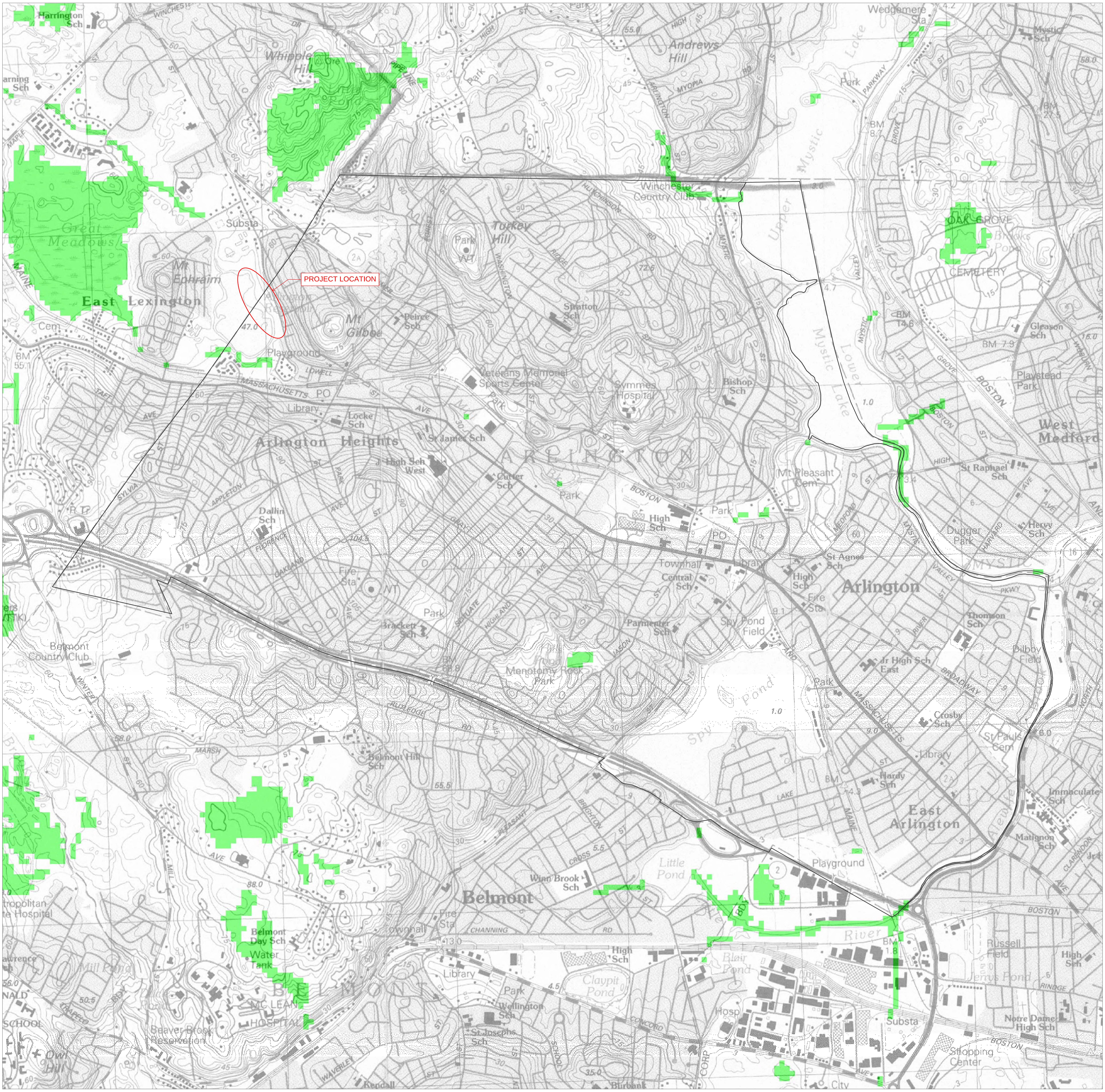
Habitat of Potential Regional or Statewide Importance
Town of ARLINGTON, MA



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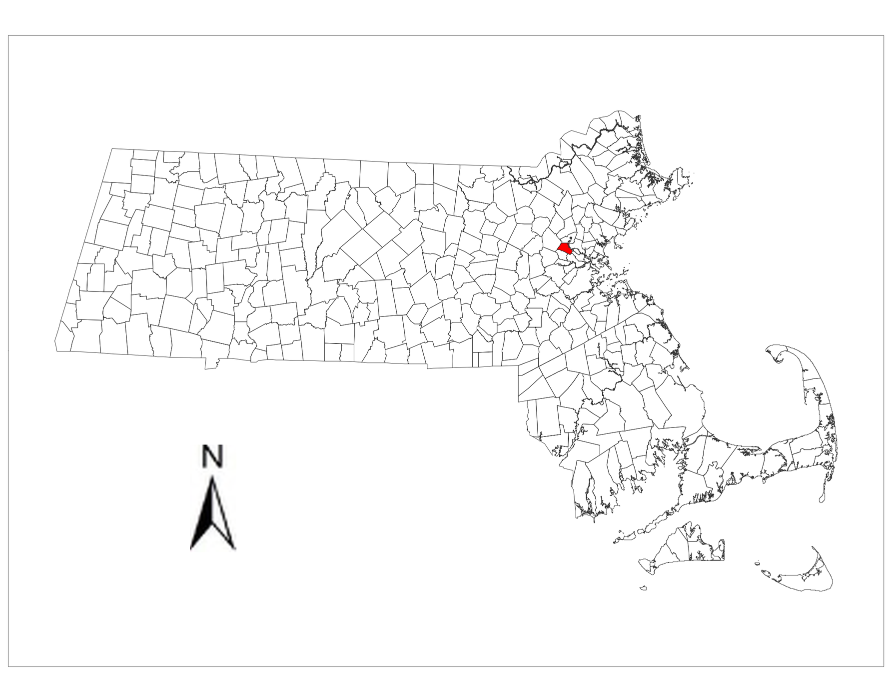
Important Wildlife Habitat



Updated November 2011

The MassDEP's Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands, June 2006 adopted a new approach for assessing wildlife habitat impacts associated with work in wetlands. This approach utilizes maps developed at the University of Massachusetts Amherst using the Conservation Assessment and Prioritization System (CAPS). The maps depict "Habitat of Potential Regional or Statewide Importance" that may trigger more intensive levels of review. For more information on how to assess wildlife habitat impacts, see Section III of the Guidance document: http://www.mass.gov/dep/water/laws/wldhab.pdf.

The CAPS model assesses the ecological integrity of Massachusetts landscape features as influenced by environmental stressor metrics (e.g. pollution, fragmentation). CAPS relies on data that are broadly available across Massachusetts. Ecological features which are not consistently surveyed or uniformly available, such as certified vernal pools, rare species, and contamination sites are not included in CAPS. When available, this more specific ecological information may be used in conjunction with the CAPS outputs to better understand particular sites in Massachusetts and support informed conservation decision-making. For more information on the statewide maps produced by the CAPS model, see: http://www.masscaps.org.

These maps are funded in part by the Massachusetts Executive Office of Energy and Environmental Affairs, the Massachusetts Department of Environmental Protection and the U.S. Environmental Protection Agency under section 104 (b)(3) of the U.S. Clean Water Act. Environmental data sources include the Office of Geographic and Environmental Information (MassGIS).

MassDEP

UMass Extension
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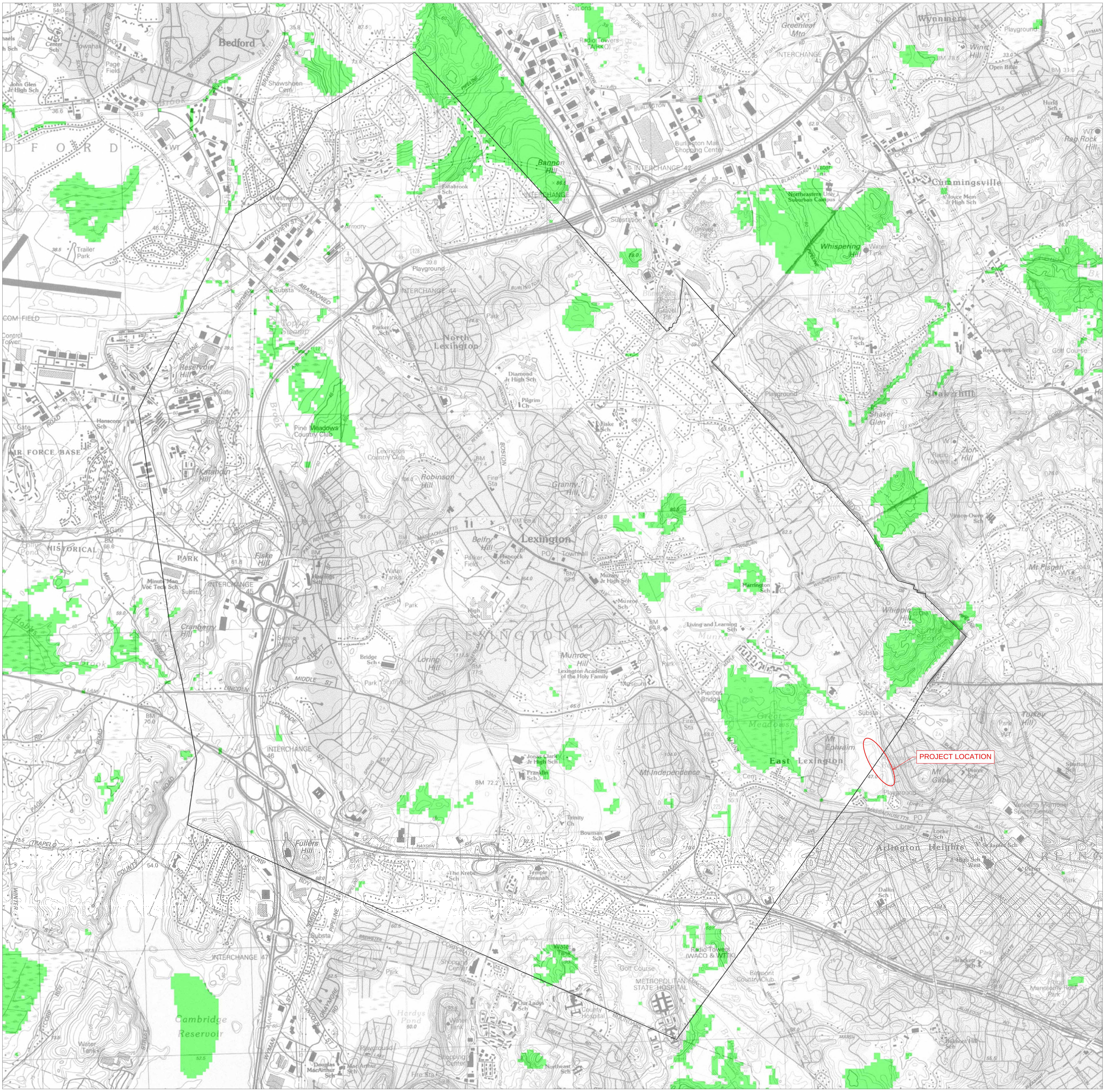
Habitat of Potential Regional or Statewide Importance
Town of LEXINGTON, MA



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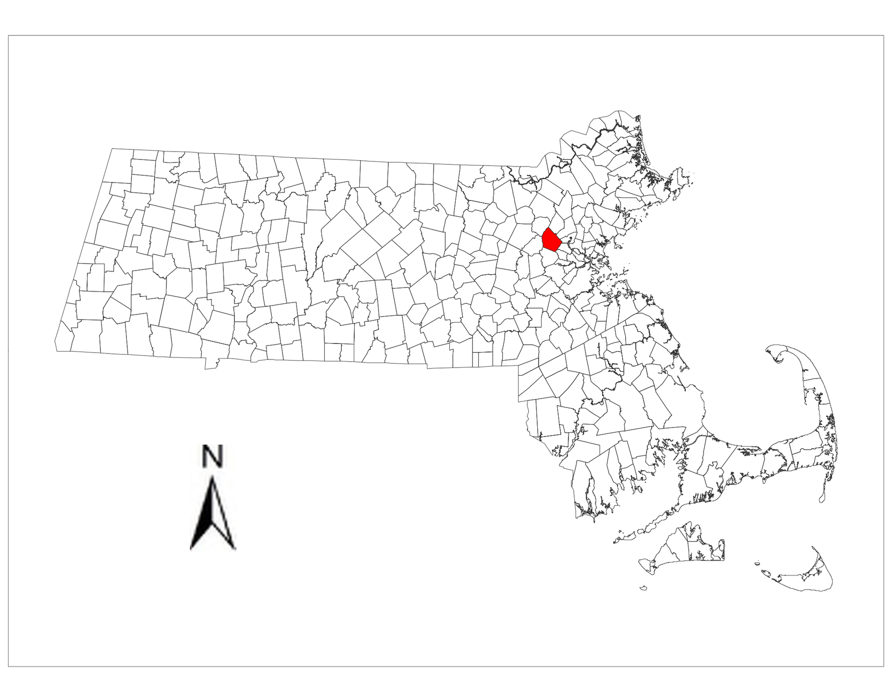
Important Wildlife Habitat

Updated November 2011



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Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	Massachusetts
Location	
Longitude	71.187 degrees West
Latitude	42.428 degrees North
Elevation	0 feet
Date/Time	Thu, 10 Sep 2020 11:23:56 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.70	0.87	1.10	**1yr**	0.75	1.04	1.28	1.63	2.08	2.67	2.90	**1yr**	2.36	2.79	3.26	3.95	4.62	**1yr**
2yr	0.35	0.53	0.67	0.88	1.10	1.39	**2yr**	0.95	1.28	1.61	2.03	2.55	3.21	3.56	**2yr**	2.84	3.42	3.92	4.66	5.31	**2yr**
5yr	0.41	0.64	0.81	1.08	1.38	1.76	**5yr**	1.19	1.60	2.05	2.58	3.24	4.07	4.53	**5yr**	3.60	4.35	4.97	5.93	6.65	**5yr**
10yr	0.47	0.73	0.93	1.26	1.64	2.10	**10yr**	1.41	1.90	2.45	3.10	3.89	4.86	5.43	**10yr**	4.31	5.22	5.95	7.11	7.88	**10yr**
25yr	0.56	0.88	1.12	1.55	2.05	2.66	**25yr**	1.77	2.39	3.11	3.94	4.95	6.17	6.92	**25yr**	5.46	6.66	7.55	9.05	9.87	**25yr**
50yr	0.62	1.00	1.29	1.81	2.43	3.19	**50yr**	2.10	2.84	3.75	4.75	5.95	7.39	8.32	**50yr**	6.54	8.00	9.04	10.87	11.71	**50yr**
100yr	0.72	1.17	1.50	2.13	2.89	3.81	**100yr**	2.50	3.37	4.48	5.69	7.13	8.85	10.00	**100yr**	7.83	9.62	10.84	13.05	13.90	**100yr**
200yr	0.82	1.34	1.74	2.49	3.44	4.56	**200yr**	2.97	4.01	5.38	6.84	8.57	10.61	12.04	**200yr**	9.39	11.57	12.99	15.68	16.50	**200yr**
500yr	1.00	1.64	2.13	3.09	4.33	5.78	**500yr**	3.74	5.05	6.85	8.72	10.91	13.49	15.38	**500yr**	11.94	14.79	16.51	20.00	20.71	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.46	0.62	0.76	0.84	**1yr**	0.65	0.82	1.14	1.43	1.76	2.39	2.46	**1yr**	2.12	2.37	2.89	3.50	4.01	**1yr**
2yr	0.33	0.51	0.63	0.85	1.05	1.25	**2yr**	0.90	1.23	1.44	1.90	2.46	3.10	3.43	**2yr**	2.74	3.30	3.78	4.49	5.14	**2yr**
5yr	0.39	0.60	0.74	1.02	1.29	1.50	**5yr**	1.12	1.46	1.72	2.23	2.87	3.73	4.13	**5yr**	3.30	3.97	4.54	5.42	6.11	**5yr**
10yr	0.43	0.66	0.82	1.15	1.48	1.71	**10yr**	1.28	1.67	1.93	2.51	3.22	4.29	4.76	**10yr**	3.80	4.58	5.22	6.21	6.96	**10yr**
25yr	0.50	0.76	0.94	1.34	1.77	2.03	**25yr**	1.53	1.98	2.28	2.95	3.75	5.14	5.73	**25yr**	4.55	5.51	6.26	7.40	8.25	**25yr**
50yr	0.55	0.84	1.04	1.50	2.02	2.32	**50yr**	1.74	2.27	2.57	3.33	4.22	5.89	6.57	**50yr**	5.21	6.32	7.18	8.42	9.37	**50yr**
100yr	0.61	0.93	1.16	1.68	2.30	2.64	**100yr**	1.99	2.58	2.91	3.58	4.74	6.77	7.54	**100yr**	5.99	7.25	8.24	9.55	10.65	**100yr**
200yr	0.69	1.04	1.31	1.90	2.65	3.01	**200yr**	2.29	2.94	3.30	4.00	5.35	7.76	8.65	**200yr**	6.87	8.32	9.45	10.81	12.08	**200yr**
500yr	0.80	1.19	1.54	2.23	3.17	3.58	**500yr**	2.74	3.50	3.88	4.63	6.27	9.30	10.35	**500yr**	8.23	9.95	11.33	12.69	14.28	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.31	0.48	0.59	0.79	0.97	1.13	**1yr**	0.84	1.11	1.32	1.76	2.24	2.86	3.14	**1yr**	2.53	3.02	3.50	4.29	5.02	**1yr**
2yr	0.36	0.56	0.69	0.93	1.15	1.35	**2yr**	0.99	1.32	1.56	2.06	2.66	3.34	3.71	**2yr**	2.96	3.57	4.09	4.86	5.52	**2yr**
5yr	0.45	0.69	0.86	1.18	1.50	1.78	**5yr**	1.30	1.74	2.04	2.63	3.35	4.43	4.98	**5yr**	3.92	4.79	5.42	6.45	7.20	**5yr**
10yr	0.54	0.84	1.04	1.45	1.87	2.19	**10yr**	1.62	2.14	2.54	3.19	4.02	5.51	6.24	**10yr**	4.88	6.00	6.73	8.03	8.82	**10yr**
25yr	0.71	1.07	1.34	1.91	2.51	2.88	**25yr**	2.17	2.82	3.36	4.11	5.11	7.32	8.42	**25yr**	6.48	8.09	8.97	10.76	11.55	**25yr**
50yr	0.85	1.30	1.62	2.33	3.13	3.56	**50yr**	2.70	3.48	4.16	4.99	6.13	9.11	10.57	**50yr**	8.06	10.16	11.13	13.44	14.18	**50yr**
100yr	1.04	1.58	1.98	2.85	3.92	4.39	**100yr**	3.38	4.29	5.16	6.33	7.35	11.32	13.28	**100yr**	10.02	12.77	13.82	16.82	17.43	**100yr**
200yr	1.27	1.91	2.42	3.51	4.89	5.41	**200yr**	4.22	5.29	6.41	7.73	8.81	14.10	16.70	**200yr**	12.48	16.06	17.18	21.05	21.44	**200yr**
500yr	1.65	2.46	3.17	4.60	6.54	7.13	**500yr**	5.64	6.97	8.53	10.08	11.21	18.85	22.64	**500yr**	16.68	21.77	22.89	28.39	28.21	**500yr**

APPENDIX B: SOILS MAP AND TEST PIT LOGS

Hydrologic Soil Group—Middlesex County, Massachusetts
(Arlington Reservoir)

Map Scale: 1:2,280 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0, 30, 60, 120, 180

Feet: 0, 100, 200, 400, 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 20, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 11, 2019—Oct 5, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		7.3	47.2%
253B	Hinckley loamy sand, 3 to 8 percent slopes	A	7.2	46.4%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	A	0.8	5.4%
631C	Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky	A	0.2	1.1%
Totals for Area of Interest			**15.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Town of Arlington
Owner Name

210 Lowell Street
Street Address

Map/Lot #

Arlington
City

MA
State

02474
Zip Code

B. Site Information

1. (Check one) ☐ New Construction ☐ Upgrade ☐ Repair Test pits for drainage purposes

2. Soil Survey Available? ☒ Yes ☐ No If yes: Web Soil Survey (Source) 253B (Soil Map Unit)

   Hinckley Loamy Sand
   Soil Name

   Soil Limitations

   Sandy and gravelly glaciofluvial deposits
   Soil Parent material

   Landform

3. Surficial Geological Report Available? ☒ Yes ☐ No If yes: MassGIS Oliver (Year Published/Source) Map Unit

   Sand and gravel / till and bedrock
   Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer: Wetland Type

7. Current Water Resource Conditions (USGS): 08/06/20 (Month/Day/ Year) Range: ☐ Above Normal ☒ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-1 (Hole #) 08/06/20 (Date) 7:30 AM (Time) 70*, sunny (Weather) ______ (Latitude) ______ (Longitude:)

1. Land Use: Parking lot (e.g., woodland, agricultural field, vacant lot, etc.) None (Vegetation) Many large boulders (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-2 (Slope (%))

   Description of Location: See attached sketch

2. Soil Parent Material: Till ______ (Landform) ______ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body >25 feet Drainage Way N/A feet Wetlands >25 feet

   Property Line >10 feet Drinking Water Well N/A feet Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No If yes: 68" Depth Weeping from Pit ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-27	Fill										
27-38	A	Sandy Loam	10YR3/2						Massive	Friable	
38-44	B	Sandy Loam	10YR3/4						Massive	Friable	
44-84	C	Sandy Loam	10YR5/2	44"	High and Low Chroma	>2	2	10	Massive	Friable	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-2 (Hole #) 08/06/20 (Date) 7:45 AM (Time) 70*, sunny (Weather) ______ (Latitude) ______ (Longitude:)

1. Land Use: Parking lot (e.g., woodland, agricultural field, vacant lot, etc.) None (Vegetation) Many large boulders (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-2 (Slope (%))

   Description of Location: See attached sketch

2. Soil Parent Material: Till ______ (Landform) ______ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body >25 feet Drainage Way N/A feet Wetlands >25 feet
   Property Line >10 feet Drinking Water Well N/A feet Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth Weeping from Pit ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-16	Fill										
16-30	A	Sandy Loam	10YR3/2						Massive	Friable	
30-43	B	Sandy Loam	10YR6/6	30"	High and Low Chroma	>2			Massive	Friable	
43-60	C	Sandy Loam	10YR5/3				2	10	Massive	Friable	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review (*minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-3 (Hole #) | 08/06/20 (Date) | 8:00 AM (Time) | 70*, sunny (Weather) | ______ (Latitude) | ______ (Longitude:)

1. Land Use: Parking lot (e.g., woodland, agricultural field, vacant lot, etc.) | None (Vegetation) | Many large boulders (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-2 (Slope (%))

   Description of Location: See attached sketch

2. Soil Parent Material: Till | ______ (Landform) | ______ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body >25 feet | Drainage Way N/A feet | Wetlands >25 feet
   Property Line >10 feet | Drinking Water Well N/A feet | Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth Weeping from Pit ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-9	Fill										
9-25	B	Sandy Loam	10YR6/6						Massive	Friable	
25-55	C	Sandy Loam	10YR5/3	32"	High and Low Chroma	>2	2	10	Massive	Friable	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-4 (Hole #) 08/06/20 (Date) 8:30 AM (Time) 70*, sunny (Weather) ______ (Latitude) ______ (Longitude:)

1. Land Use: Parking lot (e.g., woodland, agricultural field, vacant lot, etc.) None (Vegetation) Many large boulders (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-2 (Slope (%))

   Description of Location: See attached sketch

2. Soil Parent Material: Till ______ (Landform) ______ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body >25 feet Drainage Way N/A feet Wetlands >25 feet

   Property Line >10 feet Drinking Water Well N/A feet Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth Weeping from Pit ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	Fill										
12-61	C	Sandy Loam	10YR5/3	24"	High and Low Chroma	>2	2	10	Massive	Friable	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

[signature]	08/06/20
Signature of Soil Evaluator	Date
William Hall, P.E., S.E. 13592	06/31/21
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
Leyna Tobey - Woodard & Curran	N/A
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

See attached sketch

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE

kzla
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202
Boston, MA 02108
617 451-1018 Tel
www.kylezick.com

SCHEMATIC DESIGN SET

Job Number:

Project: ARLINGTON RES.

Drawn By: MD Checked By: KZ

Date: JUNE 30, 2020

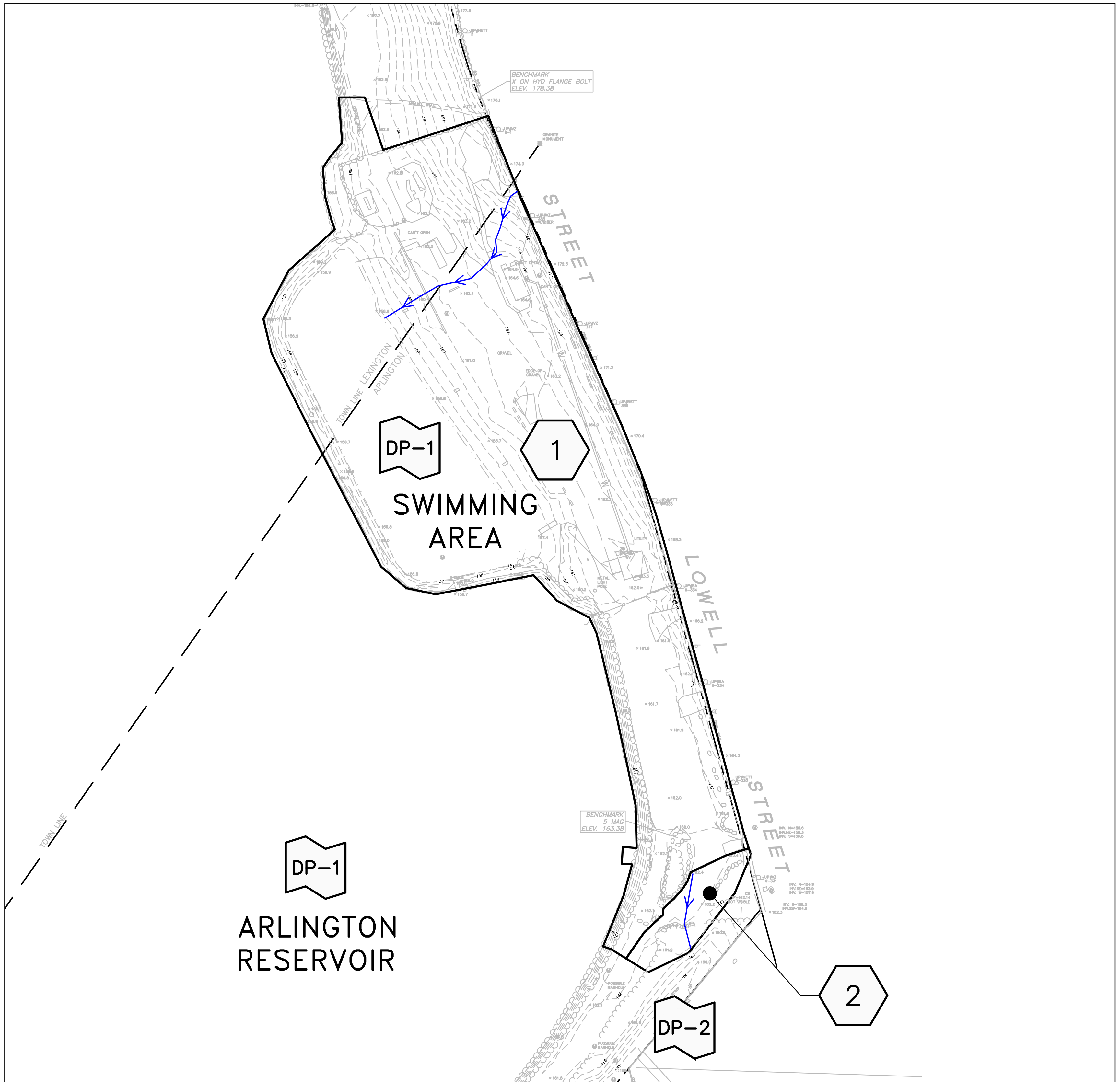
Scale: 1"=50'-0"

Drawing Title:

ENLARGEMENT PLAN

LX

APPENDIX C: STORMWATER FIGURES



N

LEGEND:

SUBCATCHMENT AREA

DESIGN POINT

LONGEST FLOW PATH

150' 0 150' 300'

BAR SCALE
1" = 150'
CHECK GRAPHIC SCALE BEFORE USING

40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

WOODARD & CURRAN

PRE-DEVELOPMENT CATCHMENT FIGURE

DESIGNED BY: LLT
DRAWN BY: LLT
CHECKED BY: BSM
2020.10.05 0233115.00-P*.dwg

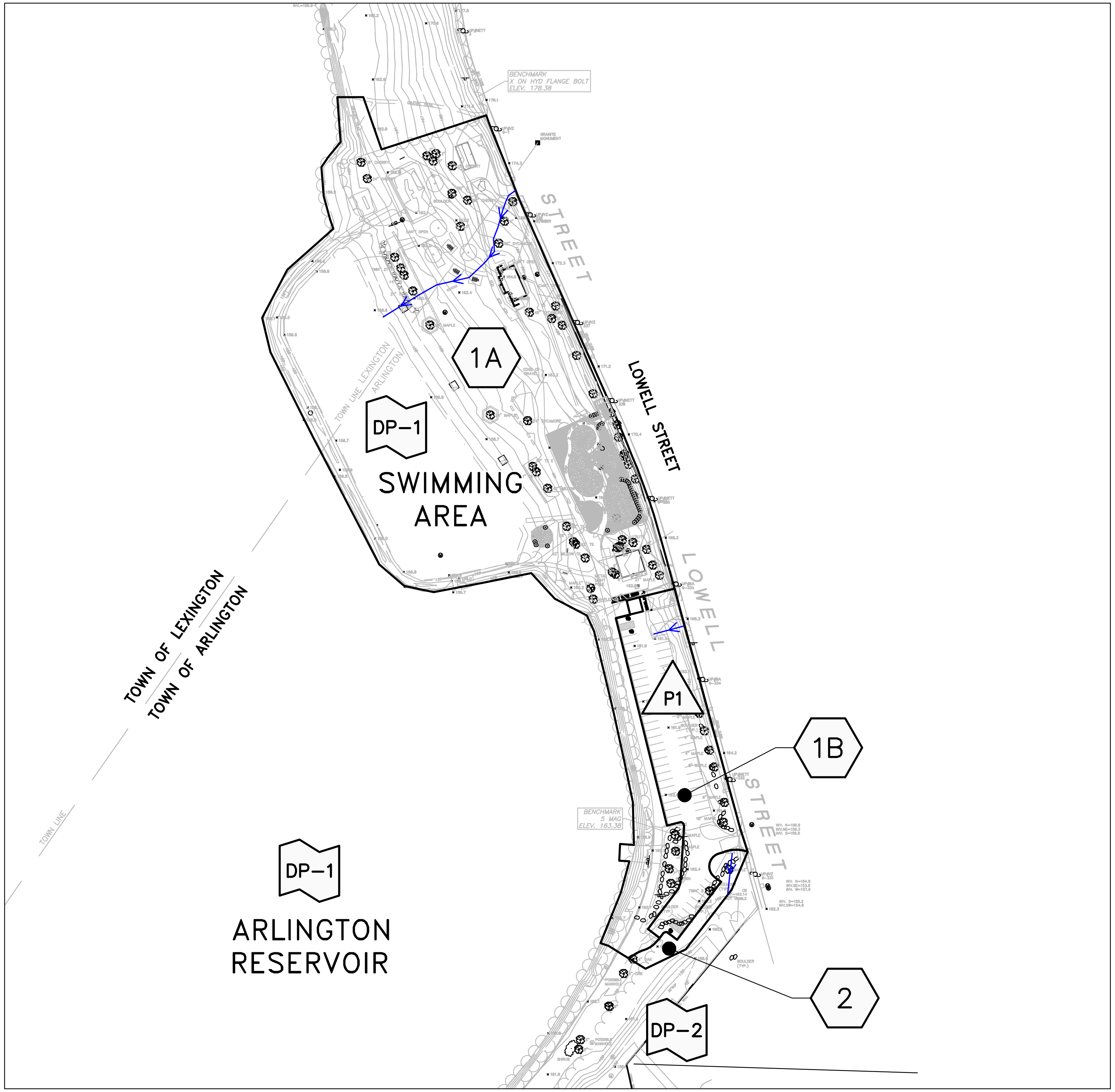
TOWN OF ARLINGTON, MASSACHUSETTS

ARLINGTON RESERVOIR – PHASE 2

JOB NO: 0233115.00
DATE: OCTOBER 2020
SCALE: AS NOTED

FIGURE 1

\\woodardcurran.net\shared\Projects\0233115.00 KZLA Architects – Arlington Reservoir Phase 2\wip\Drawings\Civil\2020.10.05 0233115.00–PRE WATERSHED.dwg, Oct 05, 2020 – 3:32pm LTOBEY



LEGEND:

- SUBCATCHMENT AREA
- DESIGN POINT
- POND
- LONGEST FLOW PATH

150' 0 150' 300'

BAR SCALE
1" = 150'
CHECK GRAPHIC SCALE BEFORE USING

\\woodardcurran.net\shared\Projects\0233115.00 KZLA Architects - Arlington Reservoir Phase 2\wip\Drawings\Civil\2020.09.29 0233115.00-POST WATERSHED.dwg, Oct 06, 2020 - 1:51pm LTOBEY

WOODARD & CURRAN
40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

POST-DEVELOPMENT
CATCHMENT FIGURE

DESIGNED BY: LLT
DRAWN BY: LLT
CHECKED BY: BSM
2020.09.29 0233115.00-P*.dwg

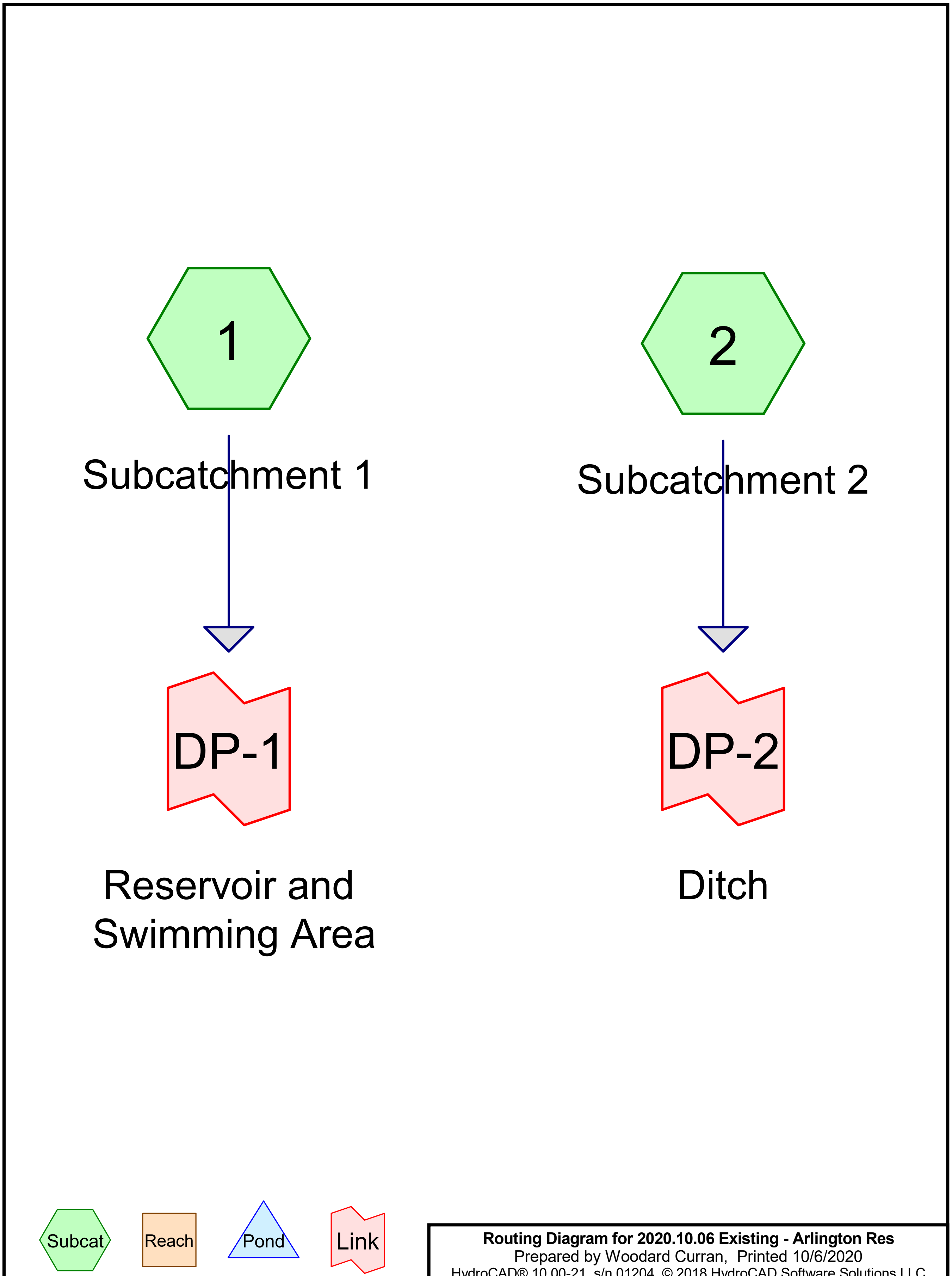
TOWN OF ARLINGTON, MASSACHUSETTS

ARLINGTON RESERVOIR - PHASE 2

JOB NO: 0233115.00
DATE: OCTOBER 2020
SCALE: AS NOTED

FIGURE 2

APPENDIX D: HYDROCAD STORMWATER MODEL REPORTS



Routing Diagram for 2020.10.06 Existing - Arlington Res
Prepared by Woodard Curran, Printed 10/6/2020
HydroCAD® 10.00-21 s/n 01204 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.531	49	50-75% Grass cover, Fair, HSG A (1, 2)
1.317	63	Beach Sand, HSG A (1)
0.379	30	Brush, Good, HSG A (1, 2)
0.046	96	Dense Sand Path, HSG A (1)
0.646	98	Gravel parking, HSG A (1, 2)
0.234	98	Impervious Surface, HSG A (1, 2)
0.055	39	Open Space, Good, HSG A (>75% Grass Cover) (1)
1.207	98	Water Surface, HSG A (1)
5.416	**70**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.416	HSG A	1, 2
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
5.416		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
1.531	0.000	0.000	0.000	0.000	1.531	50-75% Grass cover, Fair	1, 2
1.317	0.000	0.000	0.000	0.000	1.317	Beach Sand	1
0.379	0.000	0.000	0.000	0.000	0.379	Brush, Good	1, 2
0.046	0.000	0.000	0.000	0.000	0.046	Dense Sand Path	1
0.646	0.000	0.000	0.000	0.000	0.646	Gravel parking	1, 2
0.234	0.000	0.000	0.000	0.000	0.234	Impervious Surface	1, 2
0.055	0.000	0.000	0.000	0.000	0.055	Open Space, Good	1
1.207	0.000	0.000	0.000	0.000	1.207	Water Surface	1
5.416	**0.000**	**0.000**	**0.000**	**0.000**	**5.416**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=0.58"
Tc=6.0 min CN=71 Runoff=2.96 cfs 0.251 af

Subcatchment 2: Subcatchment 2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=0.33"
Tc=6.0 min CN=64 Runoff=0.04 cfs 0.006 af

Link DP-1: Reservoir and Swimming Area Inflow=2.96 cfs 0.251 af
Primary=2.96 cfs 0.251 af

Link DP-2: Ditch Inflow=0.04 cfs 0.006 af
Primary=0.04 cfs 0.006 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.257 af Average Runoff Depth = 0.57"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

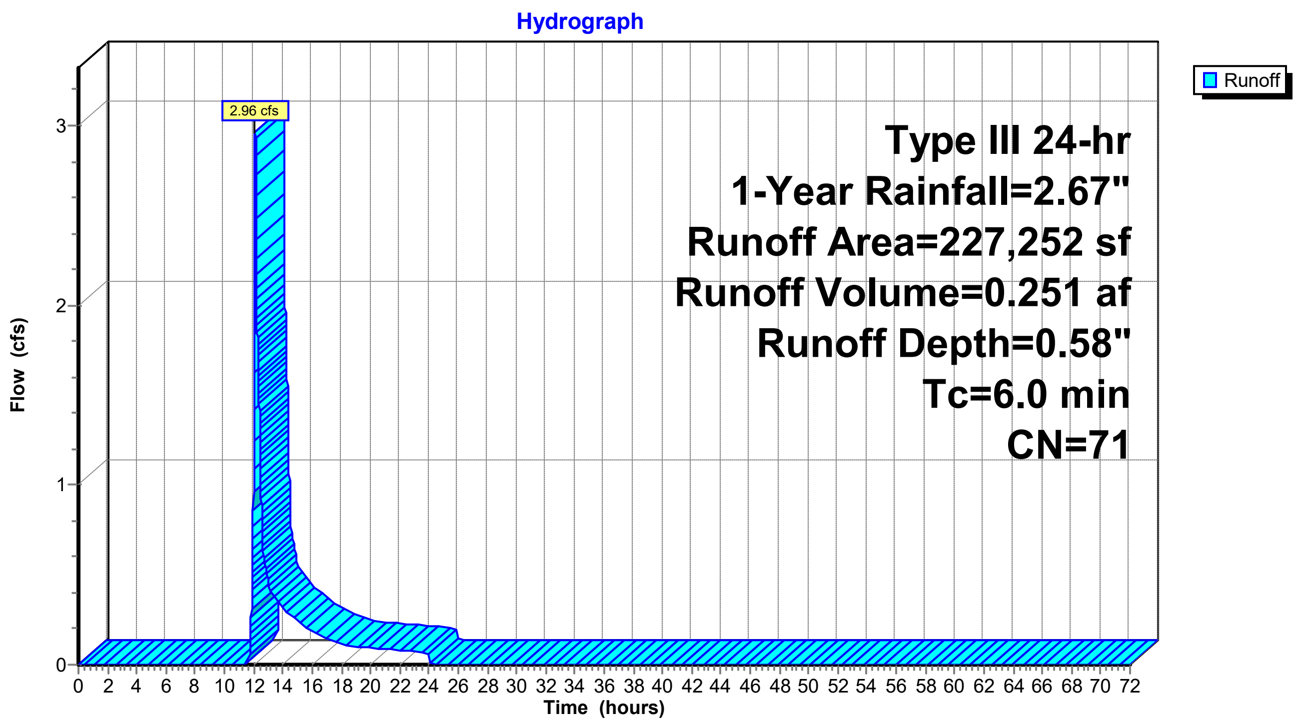
Runoff = 2.96 cfs @ 12.10 hrs, Volume= 0.251 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.67"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

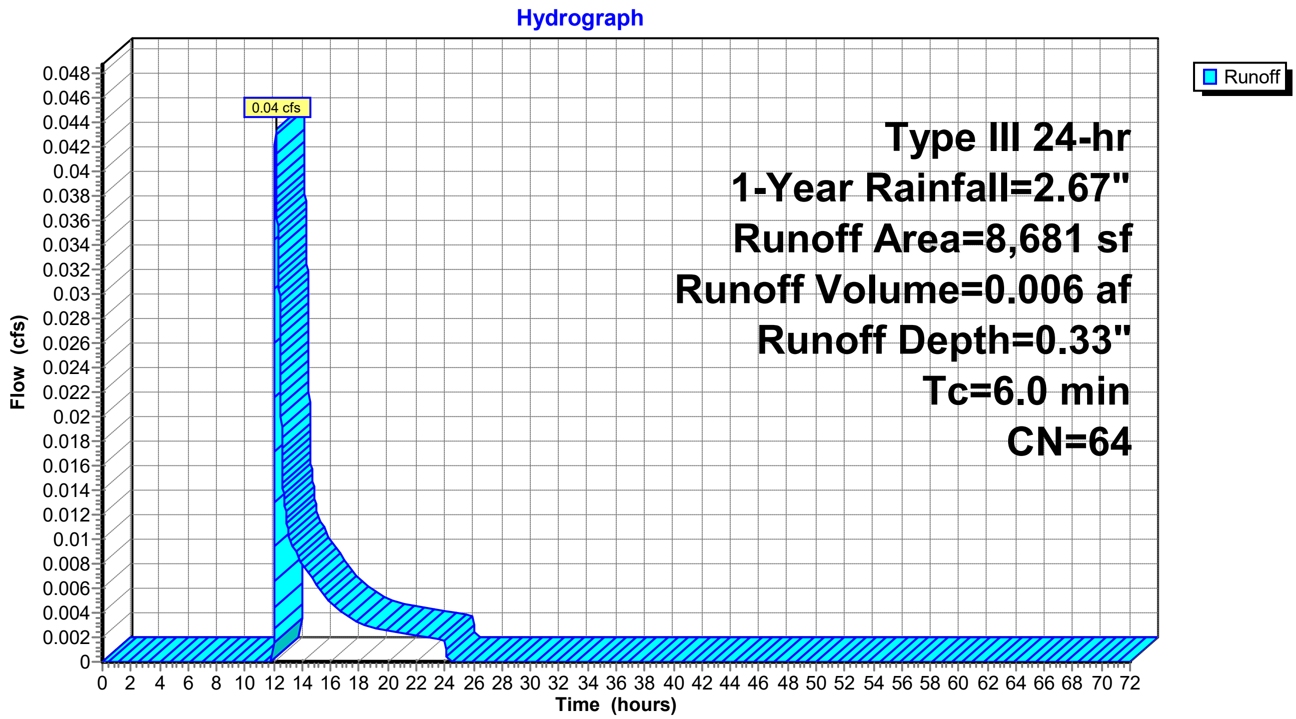
Runoff = 0.04 cfs @ 12.13 hrs, Volume= 0.006 af, Depth= 0.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.67"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

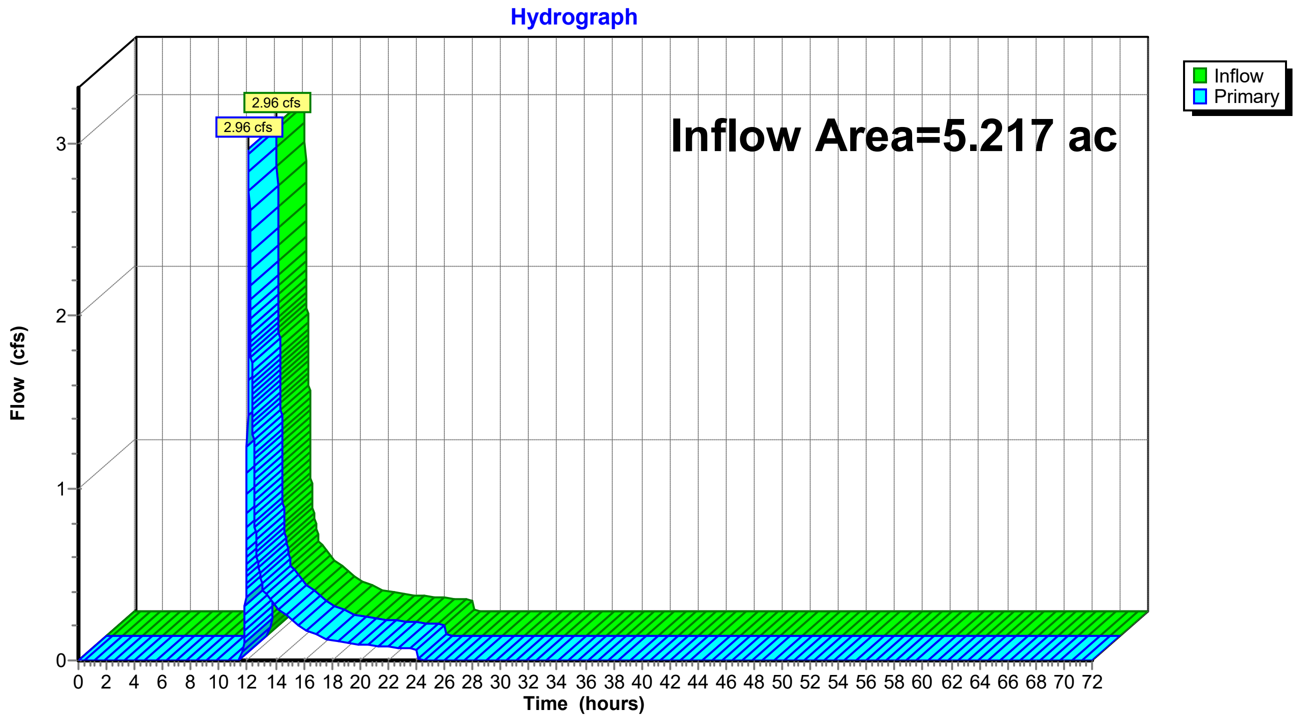


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.217 ac,	38.51% Impervious, Inflow Depth =	0.58"	for 1-Year event
Inflow =	2.96 cfs @	12.10 hrs, Volume=	0.251 af	
Primary =	2.96 cfs @	12.10 hrs, Volume=	0.251 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

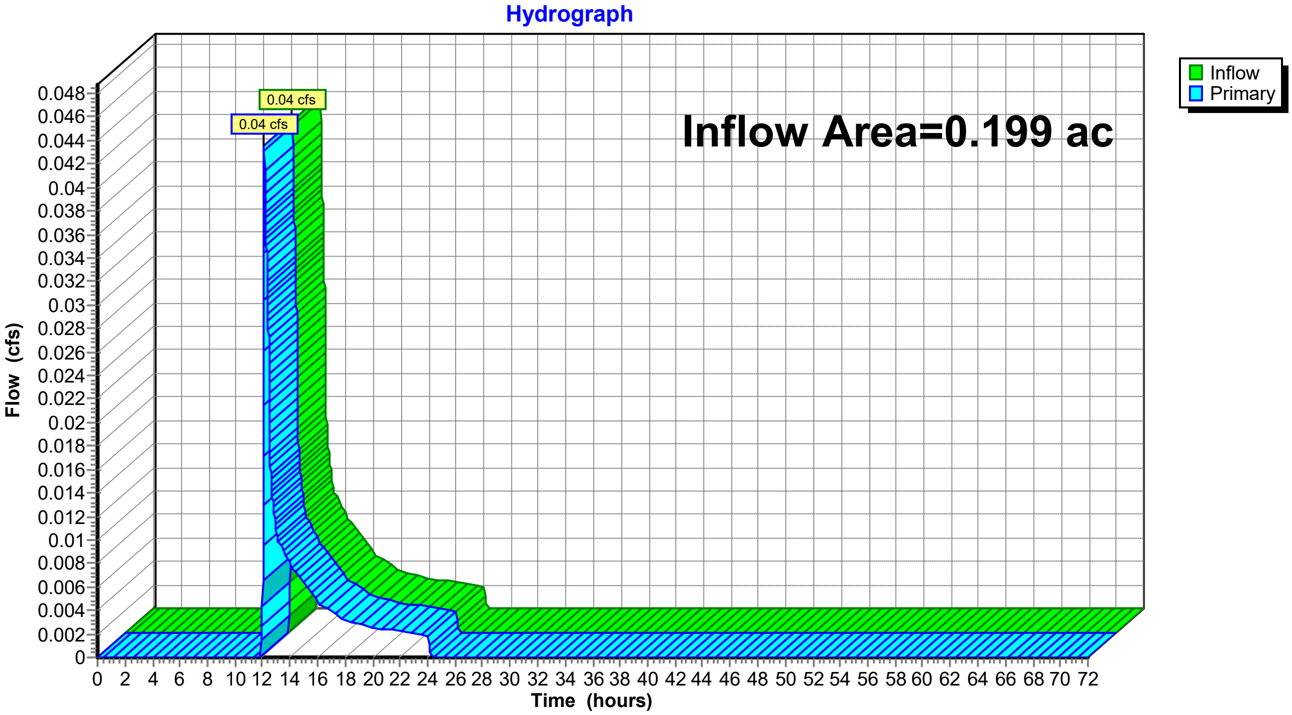


Summary for Link DP-2: Ditch

Inflow Area = 0.199 ac, 39.47% Impervious, Inflow Depth = 0.33" for 1-Year event
Inflow = 0.04 cfs @ 12.13 hrs, Volume= 0.006 af
Primary = 0.04 cfs @ 12.13 hrs, Volume= 0.006 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=0.88"
Tc=6.0 min CN=71 Runoff=4.93 cfs 0.384 af

Subcatchment 2: Subcatchment 2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=0.56"
Tc=6.0 min CN=64 Runoff=0.10 cfs 0.009 af

Link DP-1: Reservoir and Swimming Area Inflow=4.93 cfs 0.384 af
Primary=4.93 cfs 0.384 af

Link DP-2: Ditch Inflow=0.10 cfs 0.009 af
Primary=0.10 cfs 0.009 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.394 af Average Runoff Depth = 0.87"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

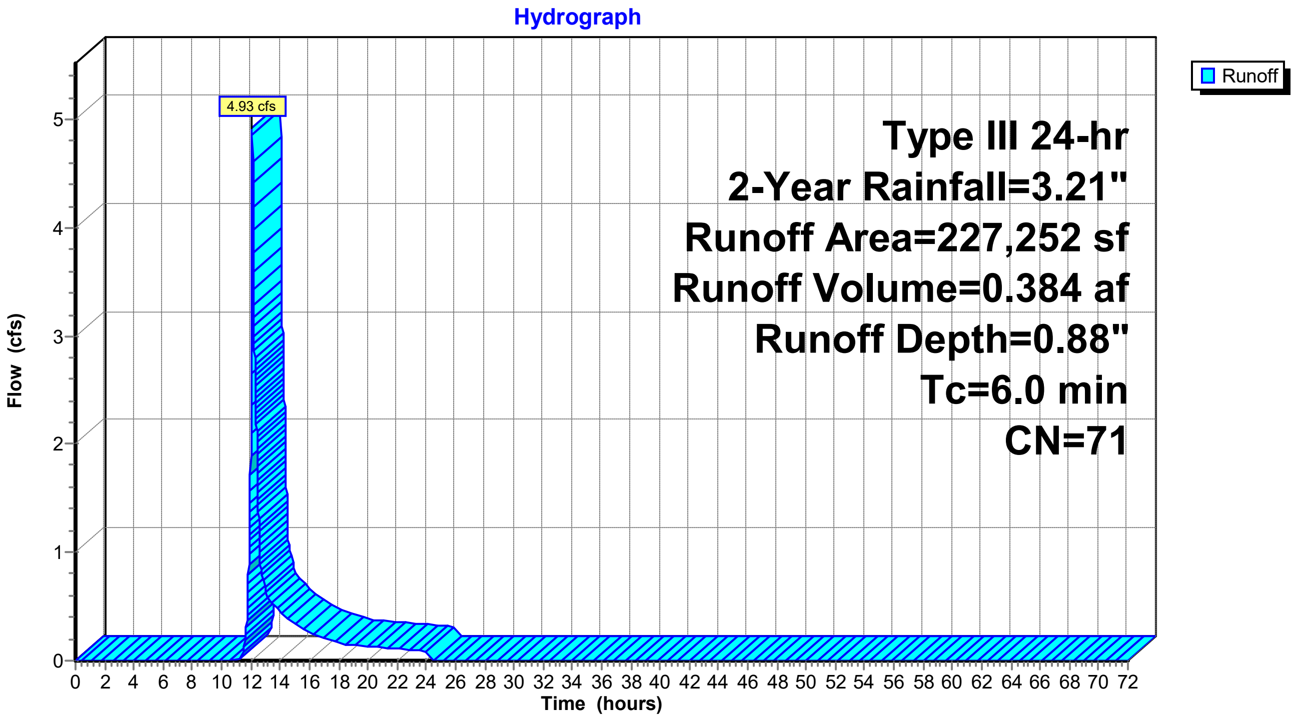
Runoff = 4.93 cfs @ 12.10 hrs, Volume= 0.384 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.21"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

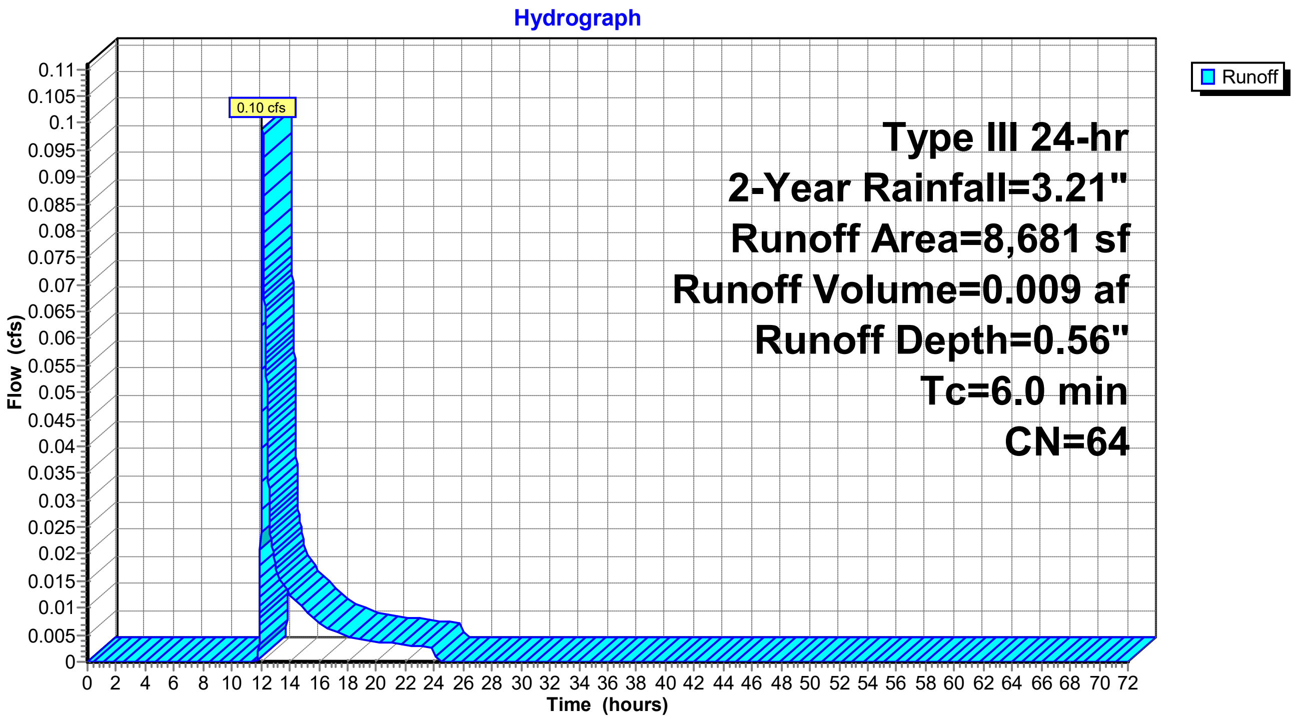
Runoff = 0.10 cfs @ 12.11 hrs, Volume= 0.009 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.21"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

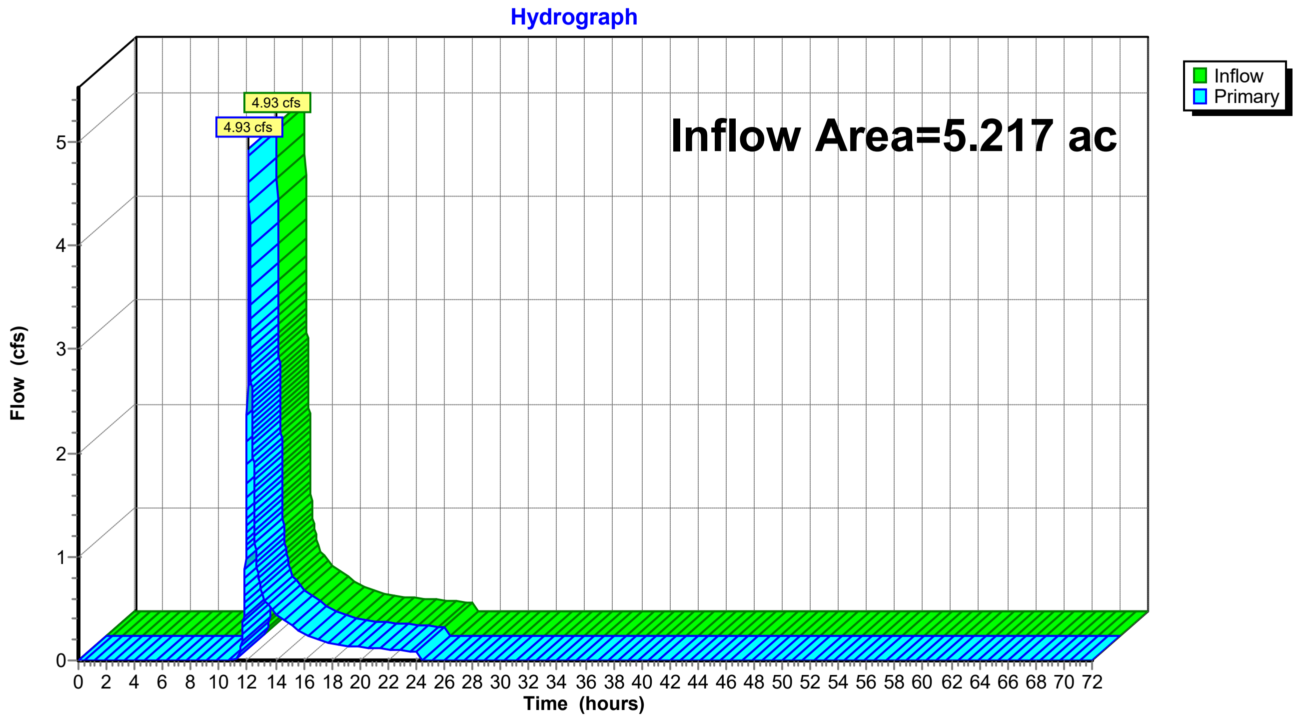


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.217 ac, 38.51% Impervious, Inflow Depth = 0.88" for 2-Year event
Inflow = 4.93 cfs @ 12.10 hrs, Volume= 0.384 af
Primary = 4.93 cfs @ 12.10 hrs, Volume= 0.384 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

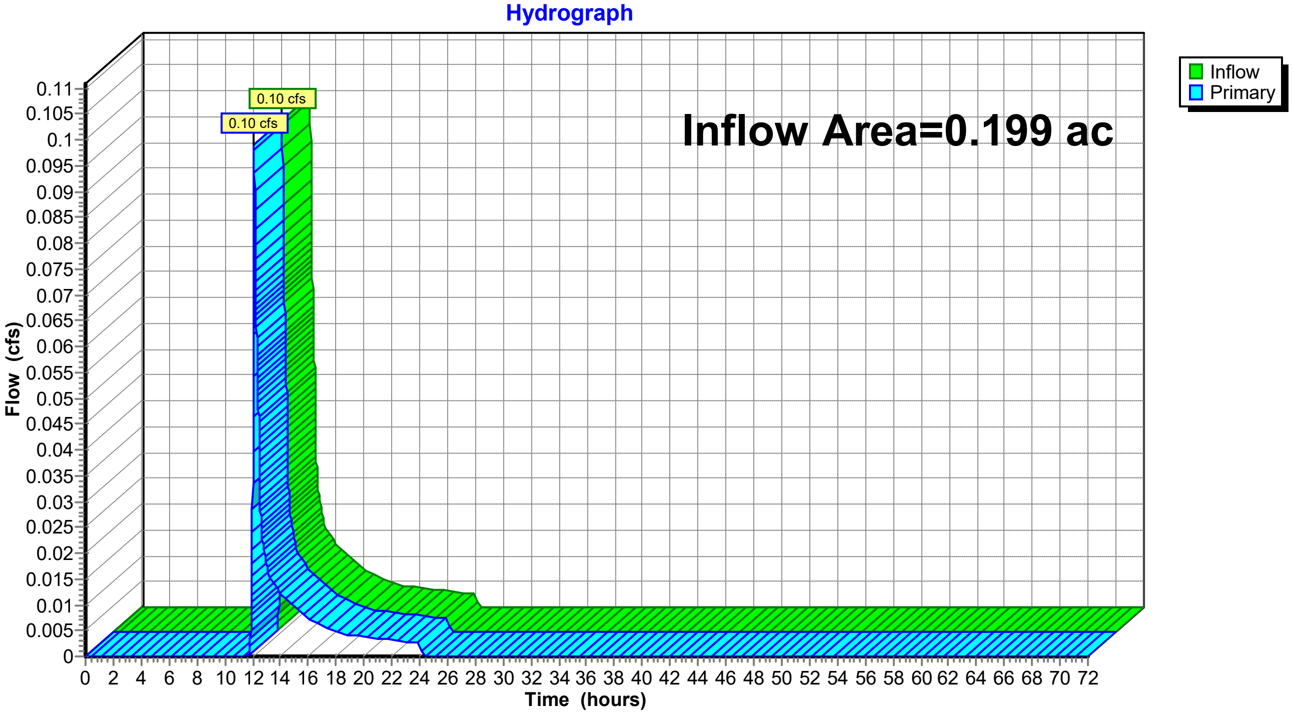


Summary for Link DP-2: Ditch

Inflow Area = 0.199 ac, 39.47% Impervious, Inflow Depth = 0.56" for 2-Year event
Inflow = 0.10 cfs @ 12.11 hrs, Volume= 0.009 af
Primary = 0.10 cfs @ 12.11 hrs, Volume= 0.009 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=2.01"
Tc=6.0 min CN=71 Runoff=12.11 cfs 0.874 af

Subcatchment 2: Subcatchment 2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=1.49"
Tc=6.0 min CN=64 Runoff=0.33 cfs 0.025 af

Link DP-1: Reservoir and Swimming Area Inflow=12.11 cfs 0.874 af
Primary=12.11 cfs 0.874 af

Link DP-2: Ditch Inflow=0.33 cfs 0.025 af
Primary=0.33 cfs 0.025 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.899 af Average Runoff Depth = 1.99"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

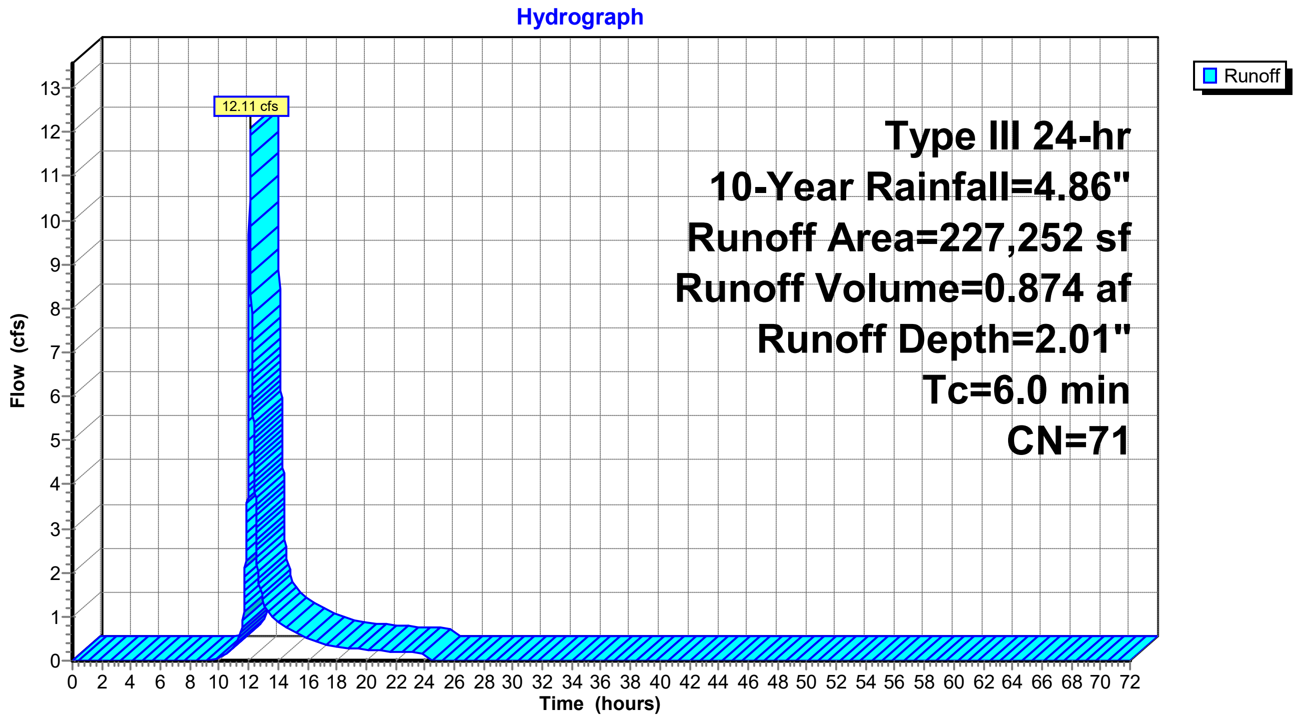
Runoff = 12.11 cfs @ 12.09 hrs, Volume= 0.874 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

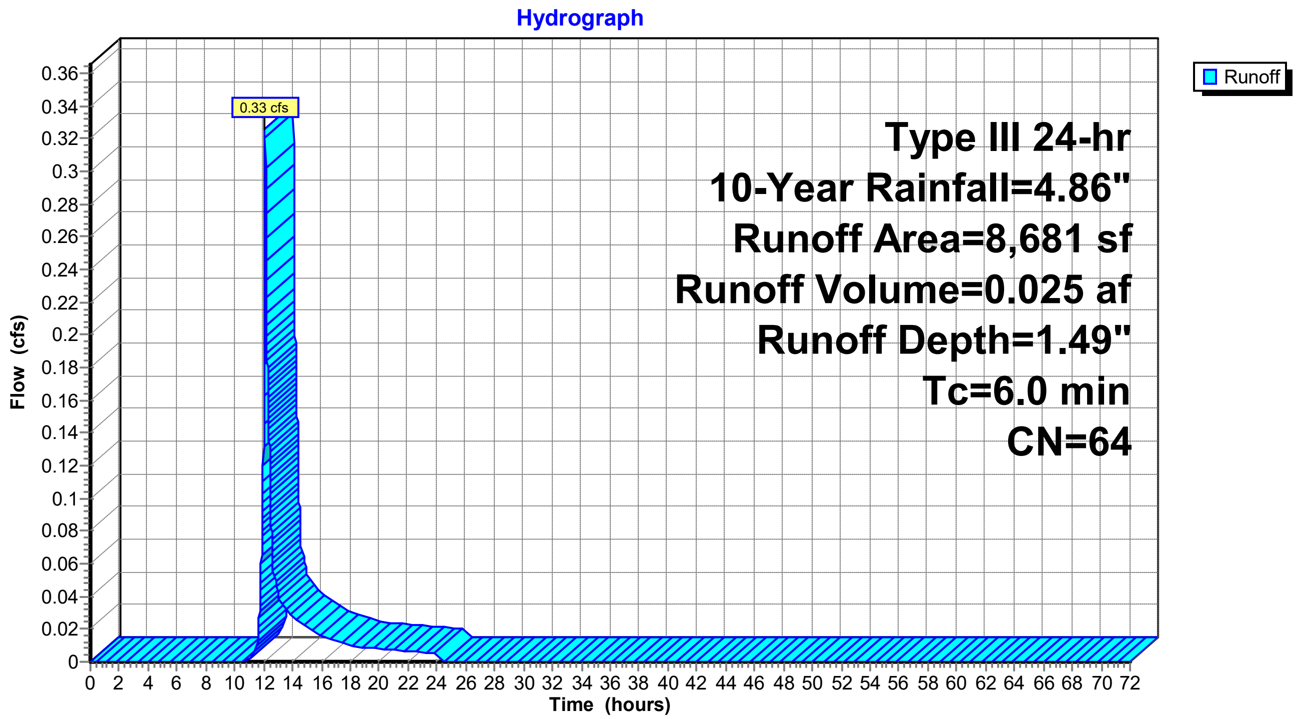
Runoff = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

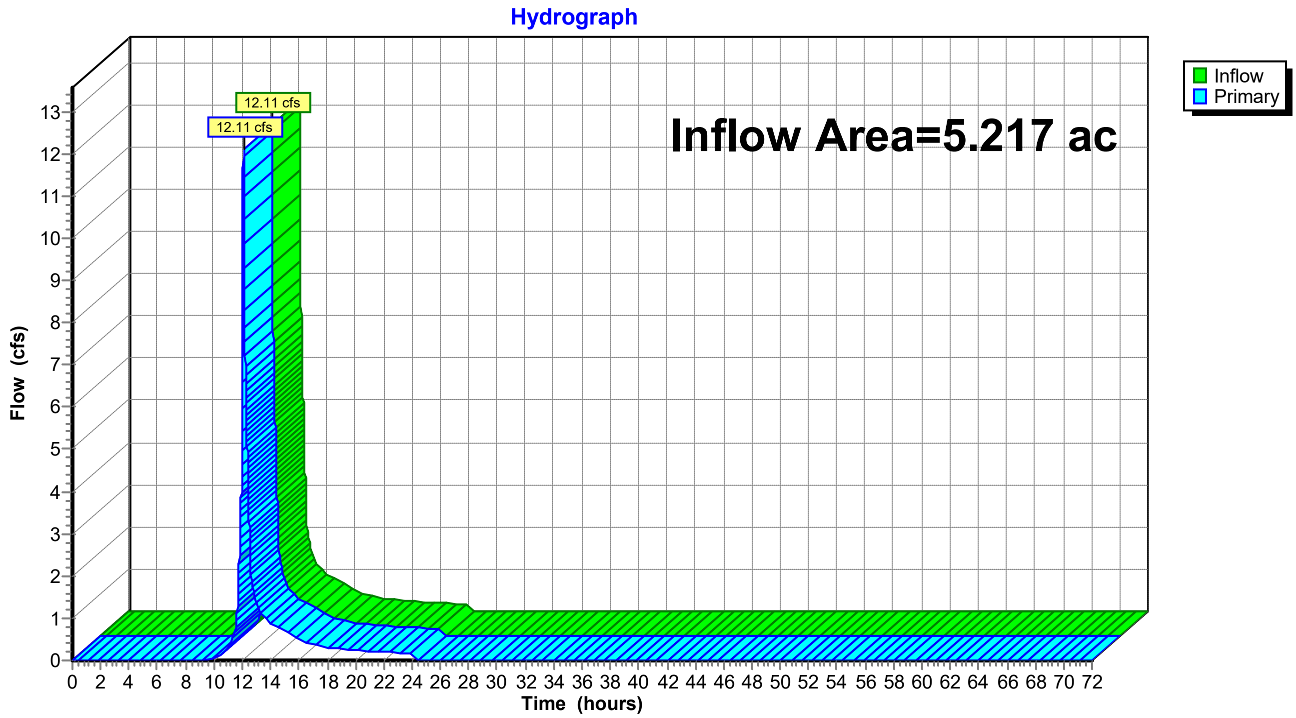


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.217 ac, 38.51% Impervious, Inflow Depth = 2.01" for 10-Year event
Inflow = 12.11 cfs @ 12.09 hrs, Volume= 0.874 af
Primary = 12.11 cfs @ 12.09 hrs, Volume= 0.874 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

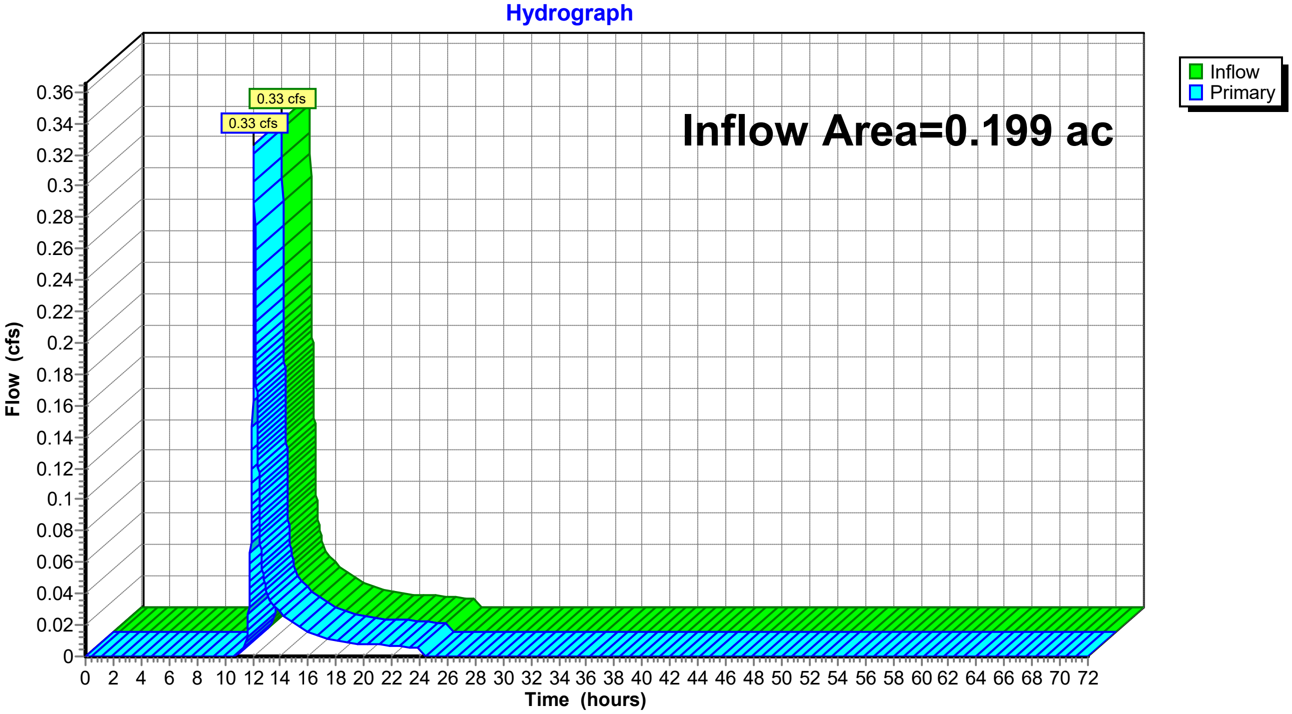


Summary for Link DP-2: Ditch

Inflow Area =	0.199 ac,	39.47% Impervious,	Inflow Depth = 1.49"	for 10-Year event
Inflow =	0.33 cfs @	12.10 hrs, Volume=	0.025 af	
Primary =	0.33 cfs @	12.10 hrs, Volume=	0.025 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=71 Runoff=18.53 cfs 1.320 af

Subcatchment 2: Subcatchment 2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=2.39"
Tc=6.0 min CN=64 Runoff=0.54 cfs 0.040 af

Link DP-1: Reservoir and Swimming Area Inflow=18.53 cfs 1.320 af
Primary=18.53 cfs 1.320 af

Link DP-2: Ditch Inflow=0.54 cfs 0.040 af
Primary=0.54 cfs 0.040 af

Total Runoff Area = 5.416 ac Runoff Volume = 1.360 af Average Runoff Depth = 3.01"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

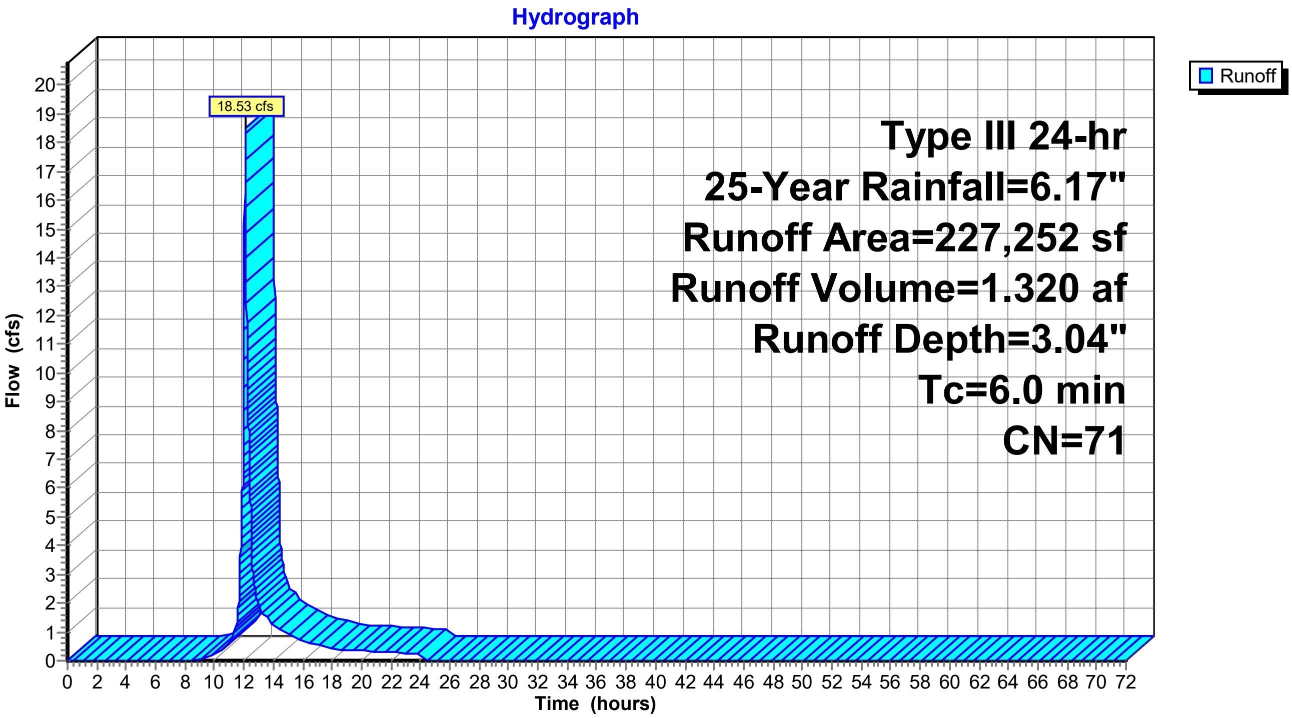
Runoff = 18.53 cfs @ 12.09 hrs, Volume= 1.320 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.17"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

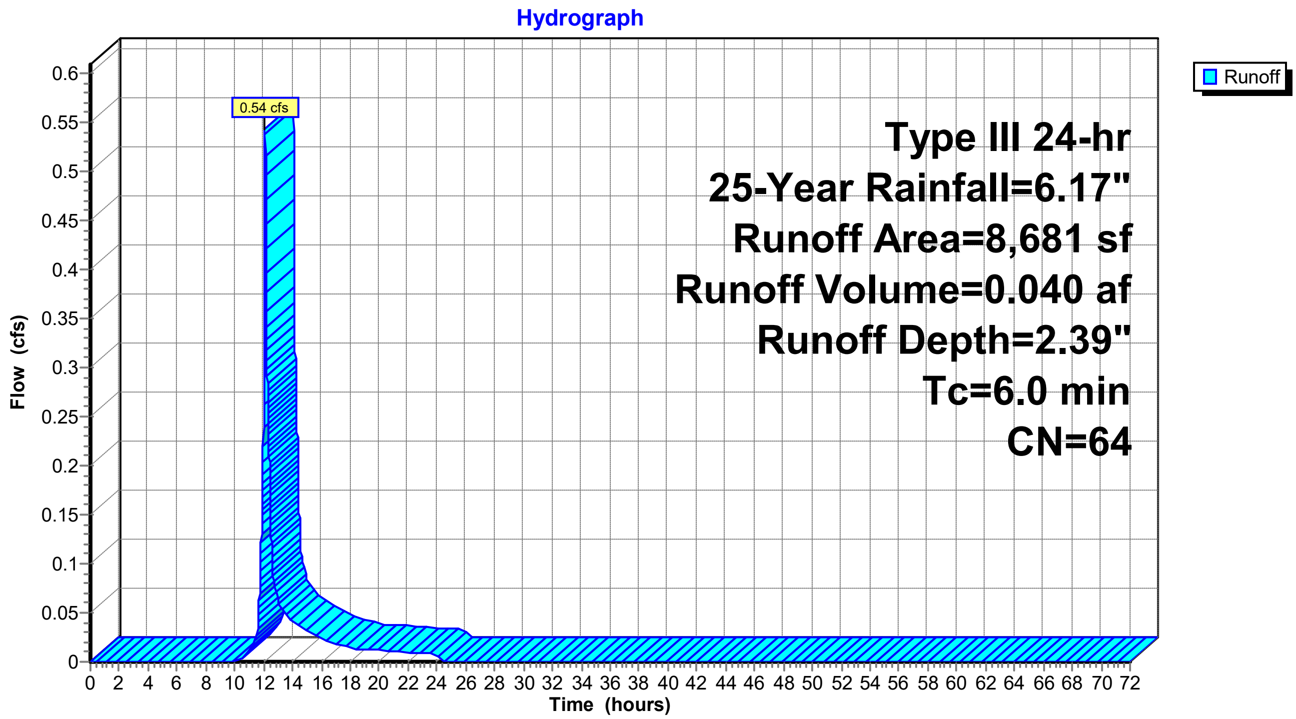
Runoff = 0.54 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.17"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

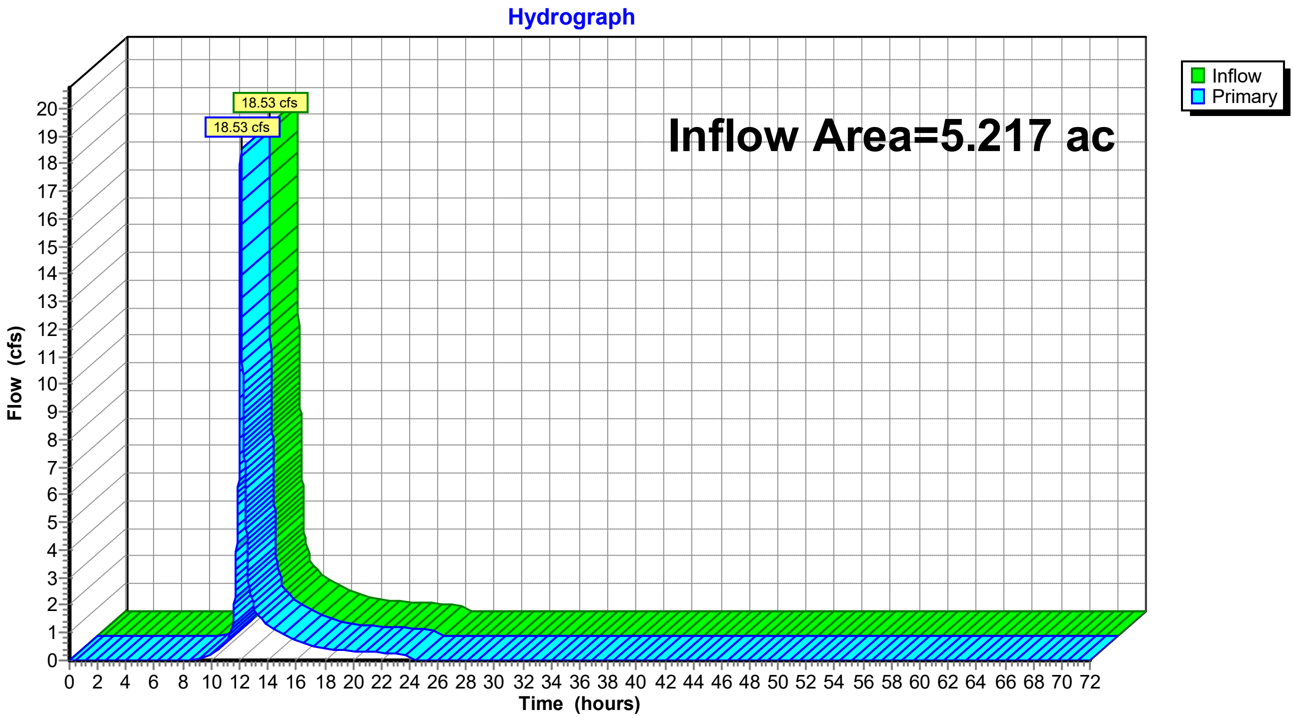


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.217 ac,	38.51% Impervious,	Inflow Depth = 3.04"	for 25-Year event
Inflow =	18.53 cfs @	12.09 hrs, Volume=	1.320 af	
Primary =	18.53 cfs @	12.09 hrs, Volume=	1.320 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

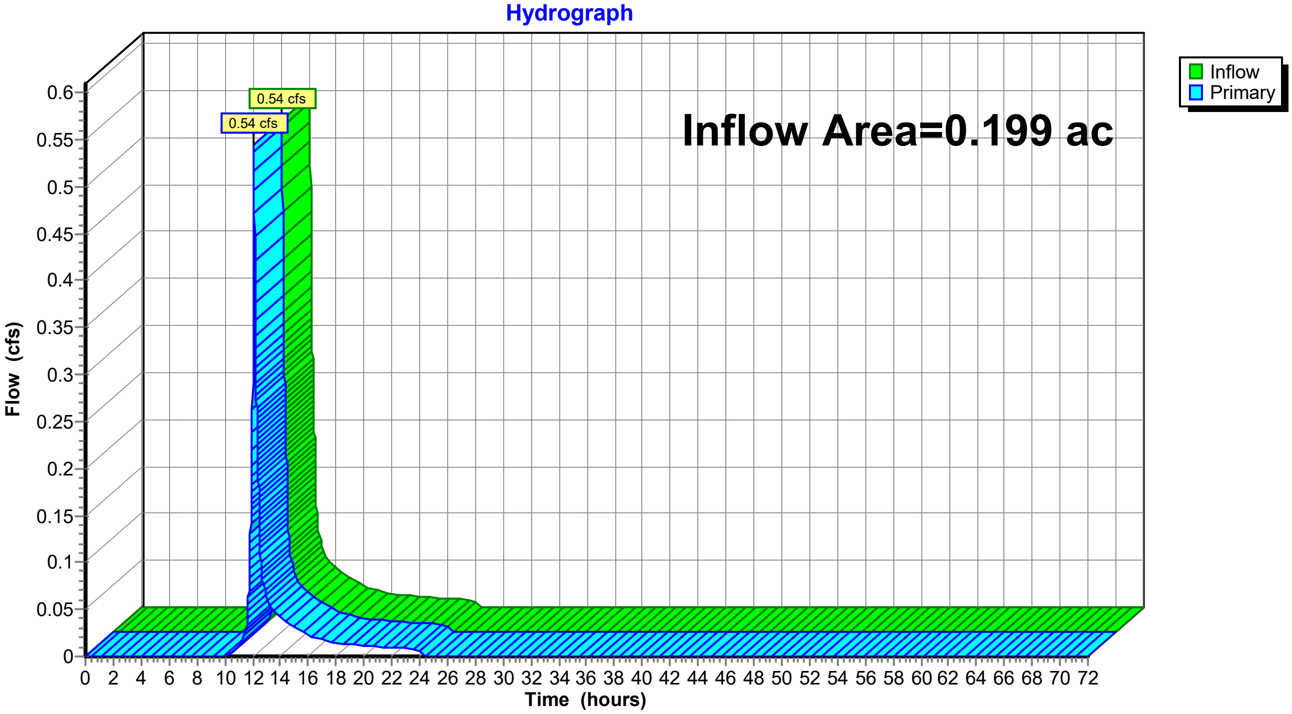


Summary for Link DP-2: Ditch

Inflow Area = 0.199 ac, 39.47% Impervious, Inflow Depth = 2.39" for 25-Year event
Inflow = 0.54 cfs @ 12.09 hrs, Volume= 0.040 af
Primary = 0.54 cfs @ 12.09 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=5.33"
Tc=6.0 min CN=71 Runoff=32.53 cfs 2.315 af

Subcatchment 2: Subcatchment 2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=4.47"
Tc=6.0 min CN=64 Runoff=1.04 cfs 0.074 af

Link DP-1: Reservoir and Swimming Area Inflow=32.53 cfs 2.315 af
Primary=32.53 cfs 2.315 af

Link DP-2: Ditch Inflow=1.04 cfs 0.074 af
Primary=1.04 cfs 0.074 af

Total Runoff Area = 5.416 ac Runoff Volume = 2.389 af Average Runoff Depth = 5.29"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

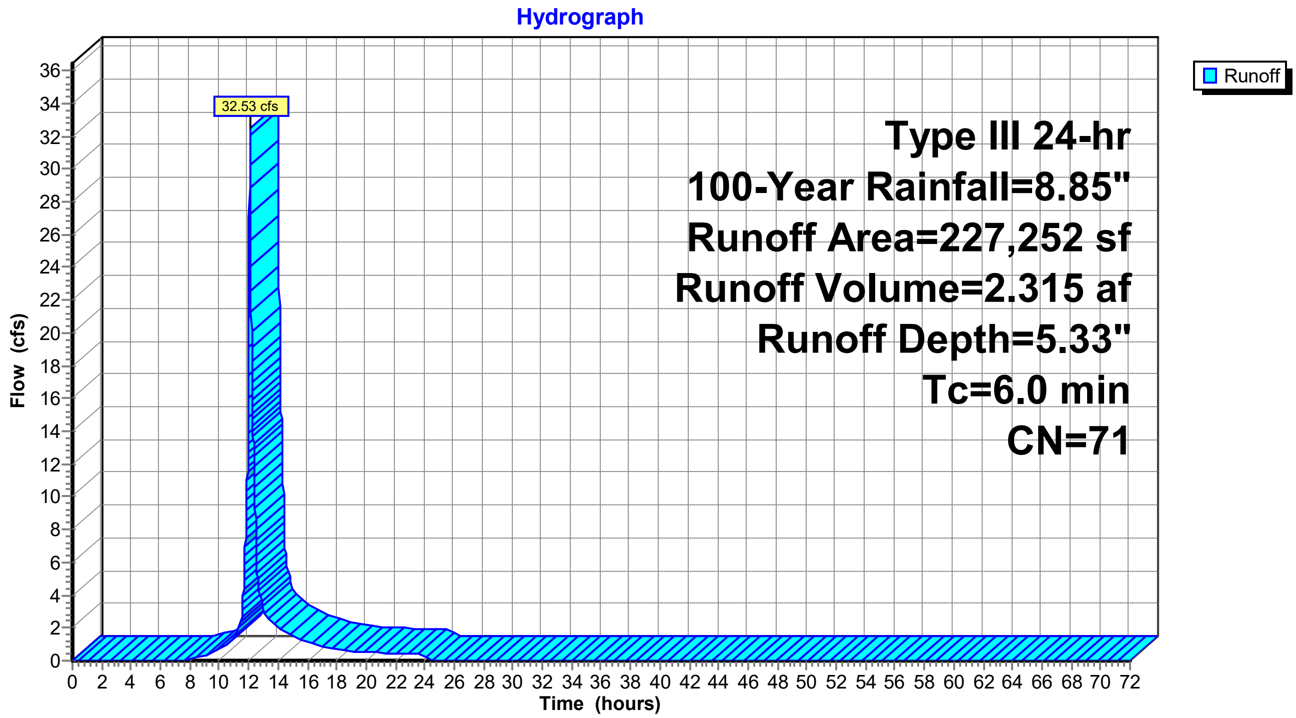
Runoff = 32.53 cfs @ 12.09 hrs, Volume= 2.315 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.85"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

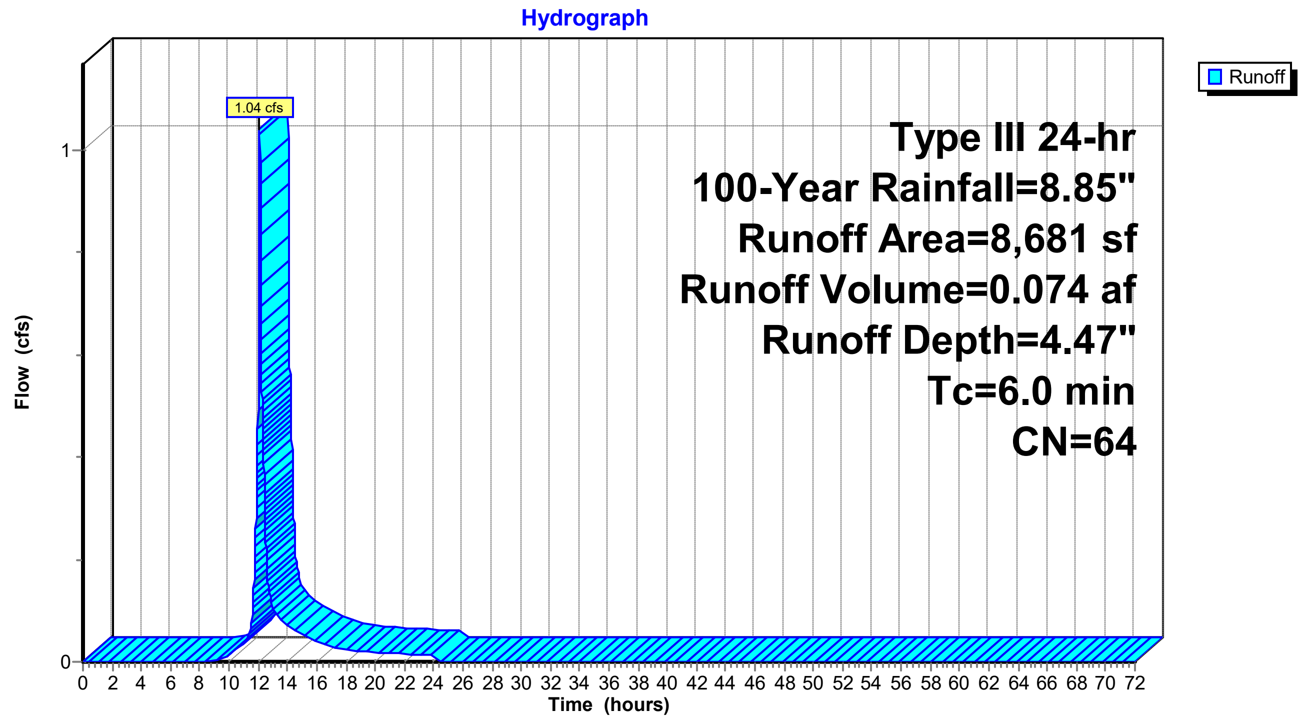
Runoff = 1.04 cfs @ 12.09 hrs, Volume= 0.074 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.85"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

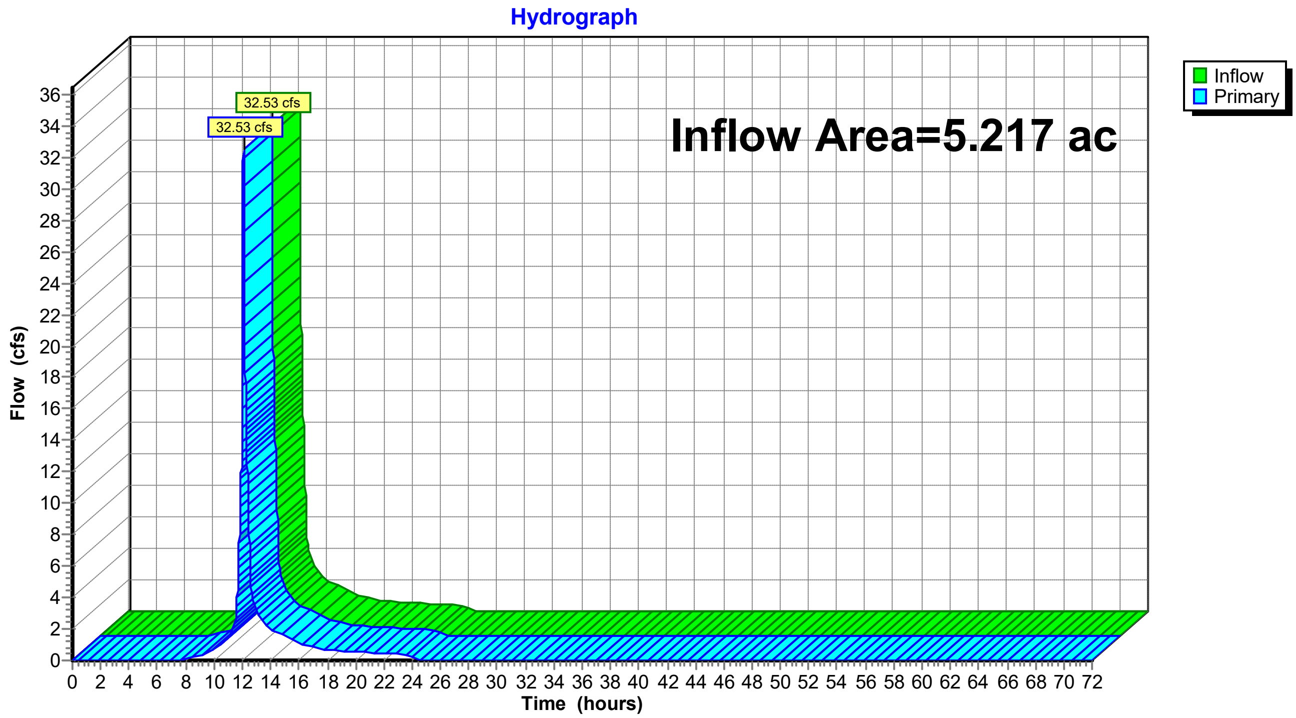


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.217 ac,	38.51% Impervious,	Inflow Depth = 5.33"	for 100-Year event
Inflow =	32.53 cfs @	12.09 hrs, Volume=	2.315 af	
Primary =	32.53 cfs @	12.09 hrs, Volume=	2.315 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

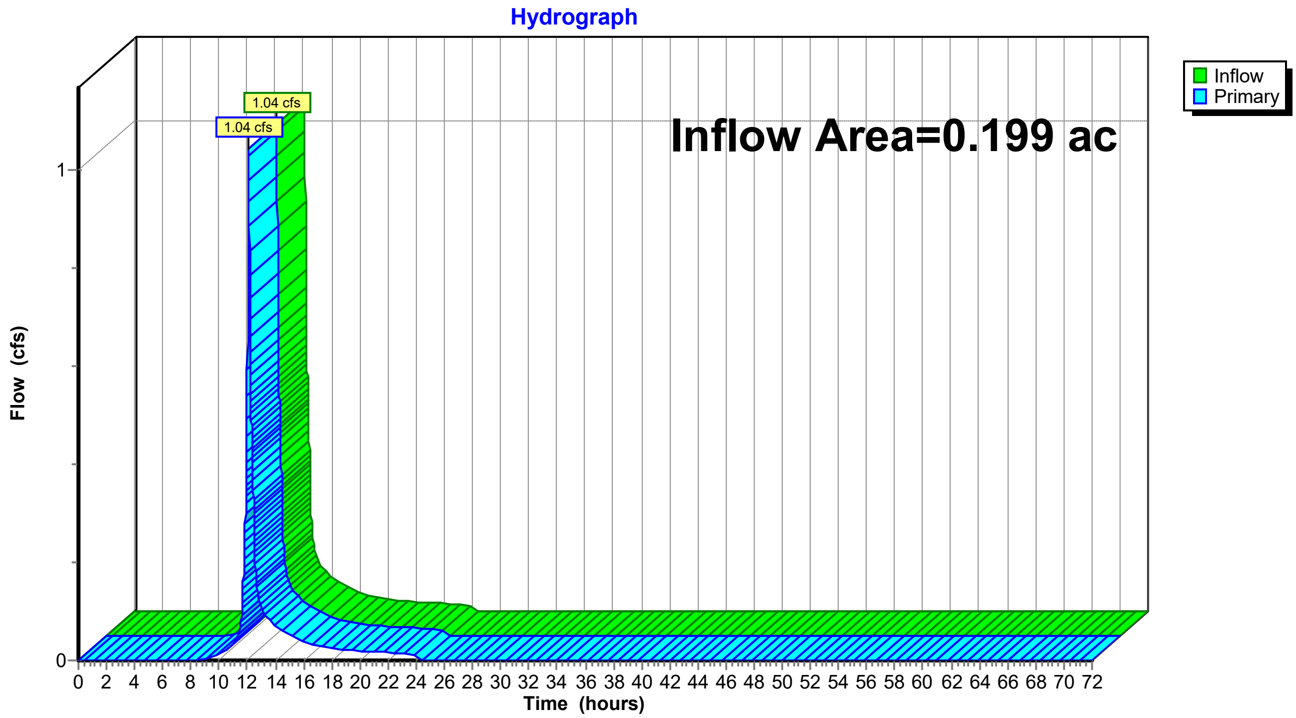


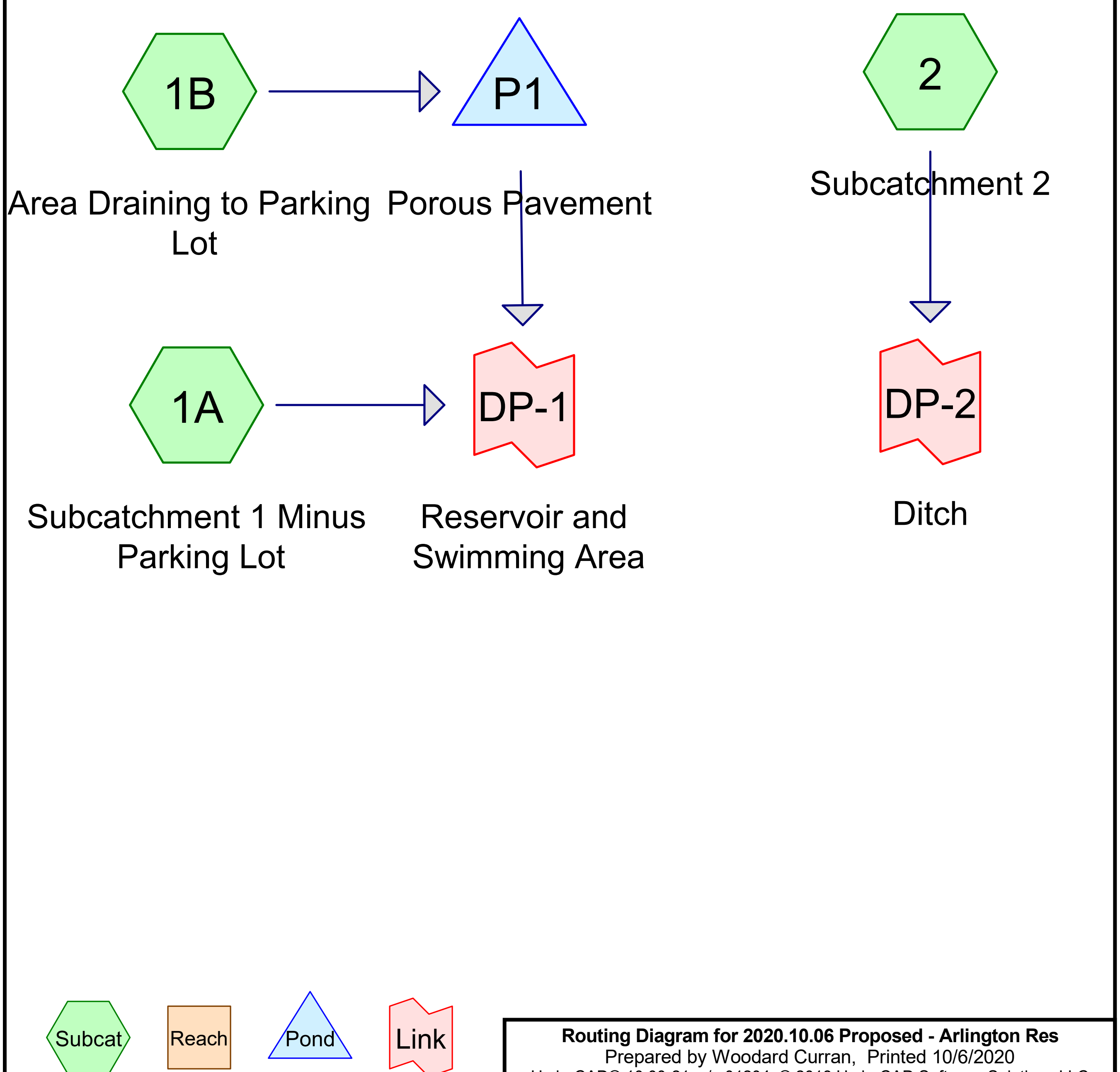
Summary for Link DP-2: Ditch

Inflow Area = 0.199 ac, 39.47% Impervious, Inflow Depth = 4.47" for 100-Year event
Inflow = 1.04 cfs @ 12.09 hrs, Volume= 0.074 af
Primary = 1.04 cfs @ 12.09 hrs, Volume= 0.074 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch





Routing Diagram for 2020.10.06 Proposed - Arlington Res
Prepared by Woodard Curran, Printed 10/6/2020
HydroCAD® 10.00-21 s/n 01204 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.573	39	>75% Grass cover, Good, HSG A (1A, 1B, 2)
1.029	63	Beach Sand, HSG A (1A)
0.304	30	Brush, Good, HSG A (1A)
0.467	98	Impervious Surface, HSG A (1A, 1B)
0.184	39	Permeable Playground Surface, Good, HSG A (1A)
0.521	98	Porous Pavement, HSG A (1A, 1B)
0.138	96	Stone Dust, HSG A (1A)
1.200	98	Water Surface, HSG A (1A)
5.416	**68**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.416	HSG A	1A, 1B, 2
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
5.416		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatch Numbers
1.573	0.000	0.000	0.000	0.000	1.573	>75% Grass cover, Good	
1.029	0.000	0.000	0.000	0.000	1.029	Beach Sand	
0.304	0.000	0.000	0.000	0.000	0.304	Brush, Good	
0.467	0.000	0.000	0.000	0.000	0.467	Impervious Surface	
0.184	0.000	0.000	0.000	0.000	0.184	Permeable Playground Surface, Good	
0.521	0.000	0.000	0.000	0.000	0.521	Porous Pavement	
0.138	0.000	0.000	0.000	0.000	0.138	Stone Dust	
1.200	0.000	0.000	0.000	0.000	1.200	Water Surface	
5.416	**0.000**	**0.000**	**0.000**	**0.000**	**5.416**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	P1	162.15	162.05	20.0	0.0050	0.013	12.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A: Subcatchment 1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=0.43"
Tc=6.0 min CN=67 Runoff=1.65 cfs 0.166 af

Subcatchment 1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=1.07"
Tc=6.0 min CN=81 Runoff=0.84 cfs 0.061 af

Subcatchment 2: Subcatchment 2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Pond P1: Porous Pavement Peak Elev=161.40' Storage=0 cf Inflow=0.84 cfs 0.061 af
Discarded=0.84 cfs 0.061 af Primary=0.00 cfs 0.000 af Outflow=0.84 cfs 0.061 af

Link DP-1: Reservoir and Swimming Area Inflow=1.65 cfs 0.166 af
Primary=1.65 cfs 0.166 af

Link DP-2: Ditch Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.227 af Average Runoff Depth = 0.50"
59.60% Pervious = 3.228 ac 40.40% Impervious = 2.188 ac

Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

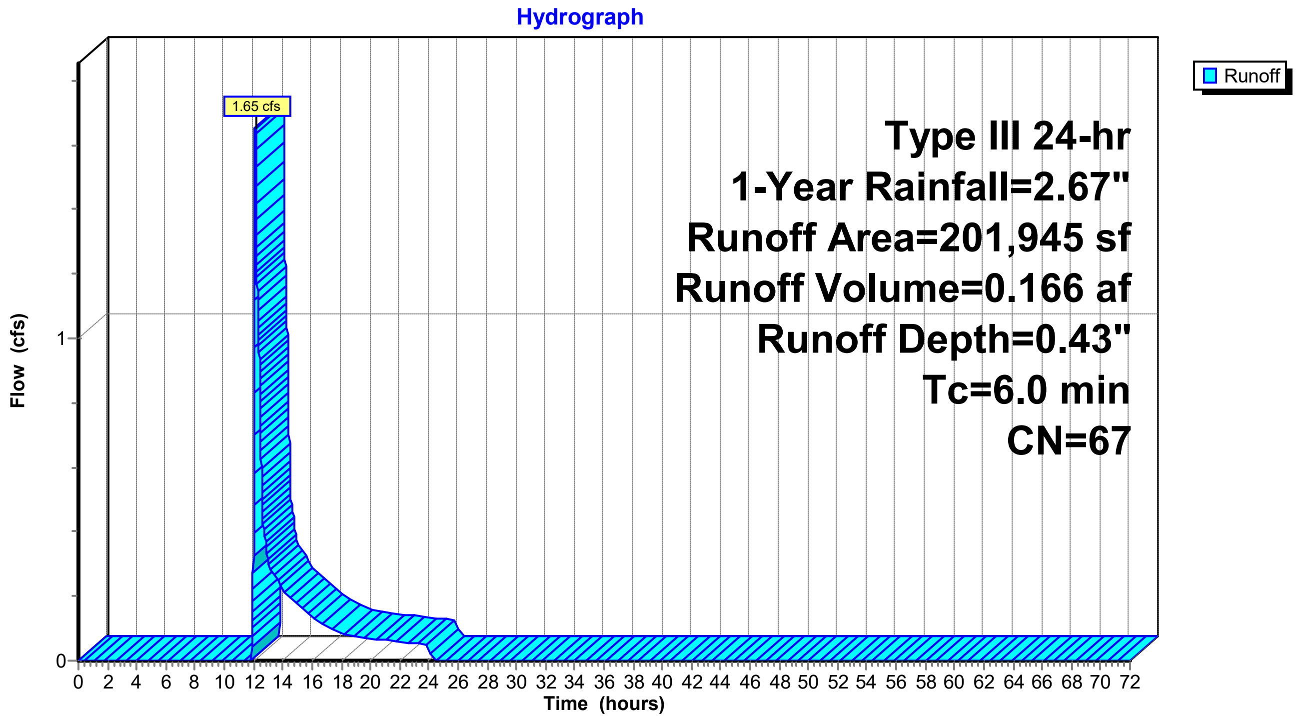
Runoff = 1.65 cfs @ 12.11 hrs, Volume= 0.166 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.67"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

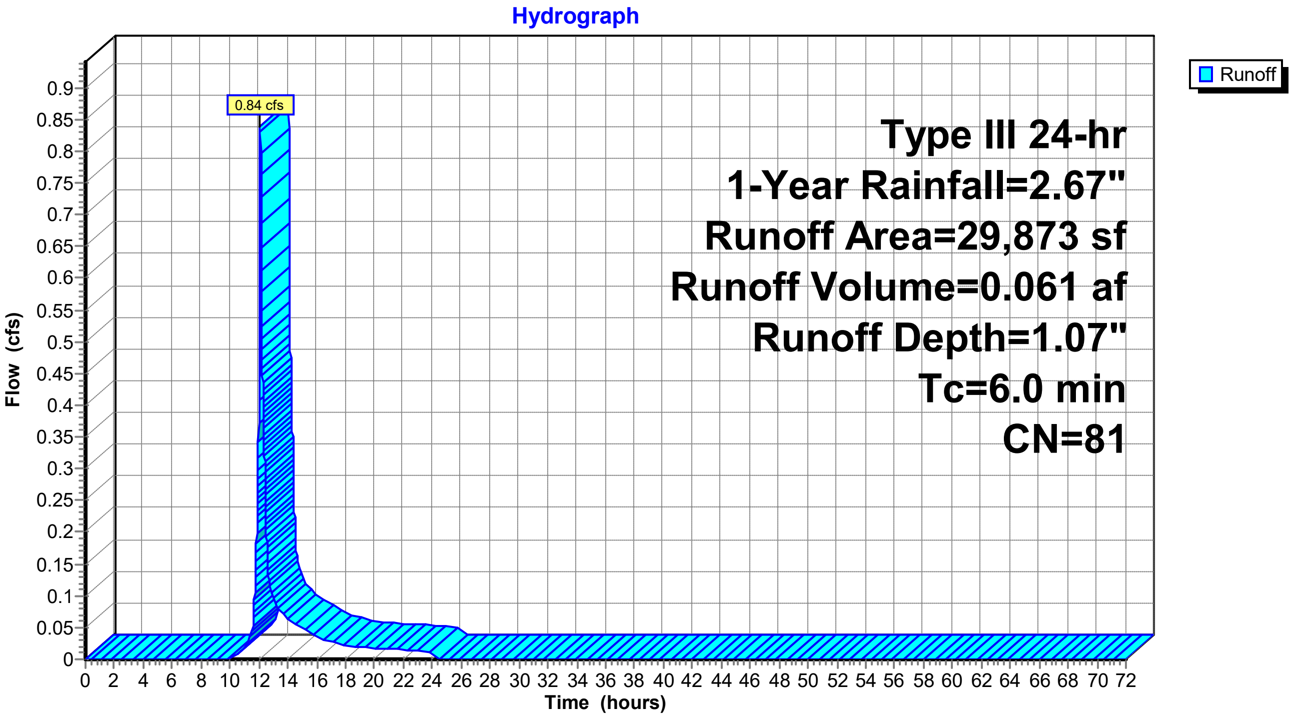
Runoff = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.67"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

[45] Hint: Runoff=Zero

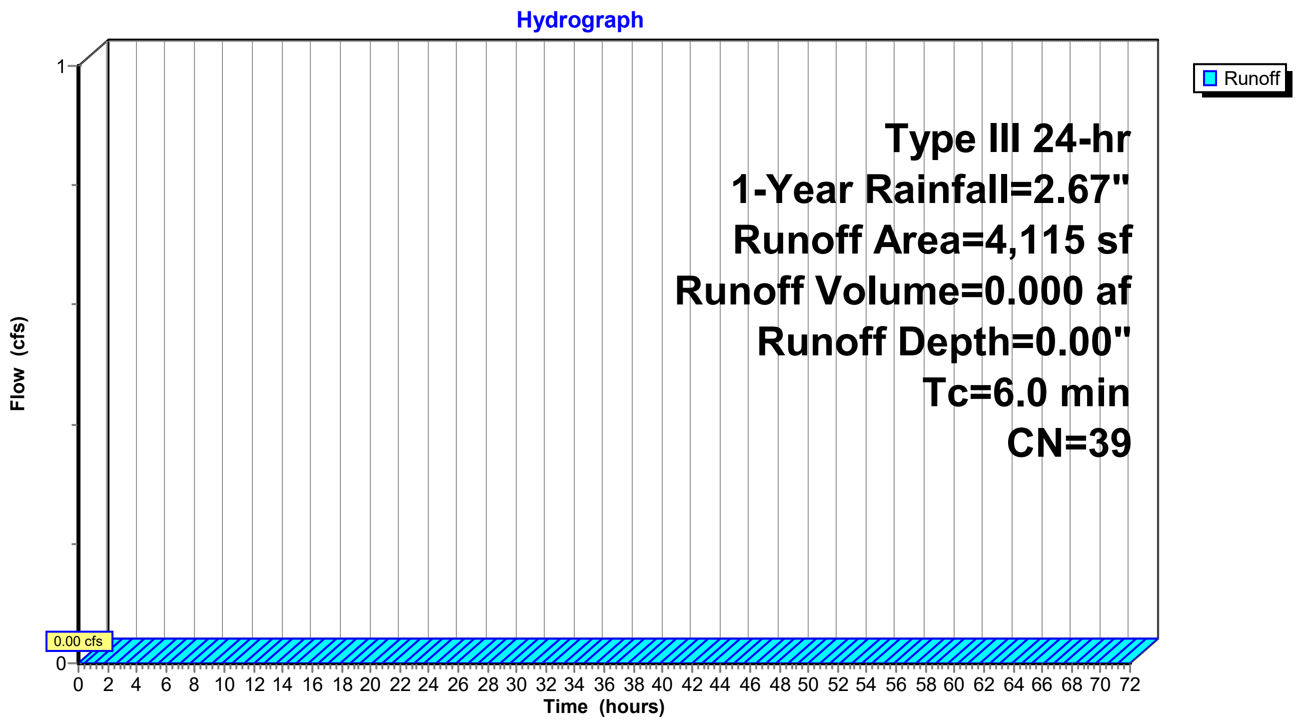
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.67"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 1.07" for 1-Year event
Inflow = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af
Outflow = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.40' @ 12.09 hrs Surf.Area= 21,411 sf Storage= 0 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (849.0 - 849.0)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

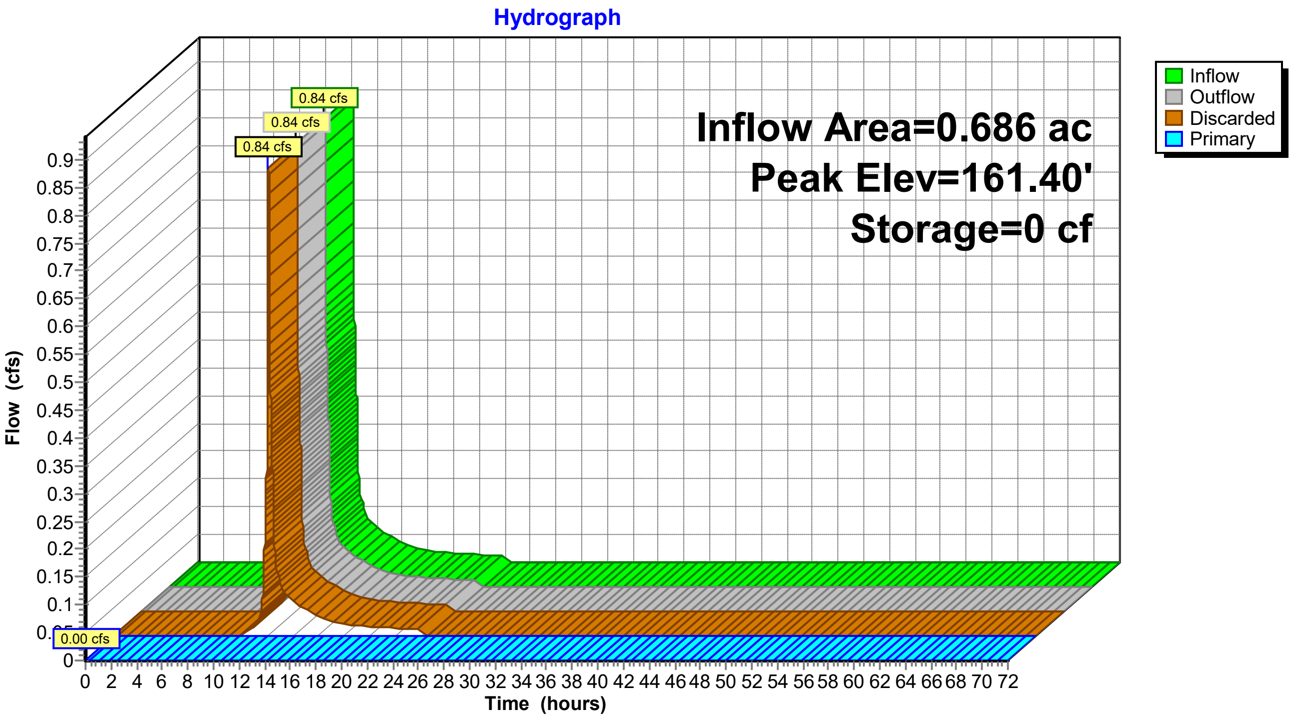
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.09 hrs HW=161.40' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

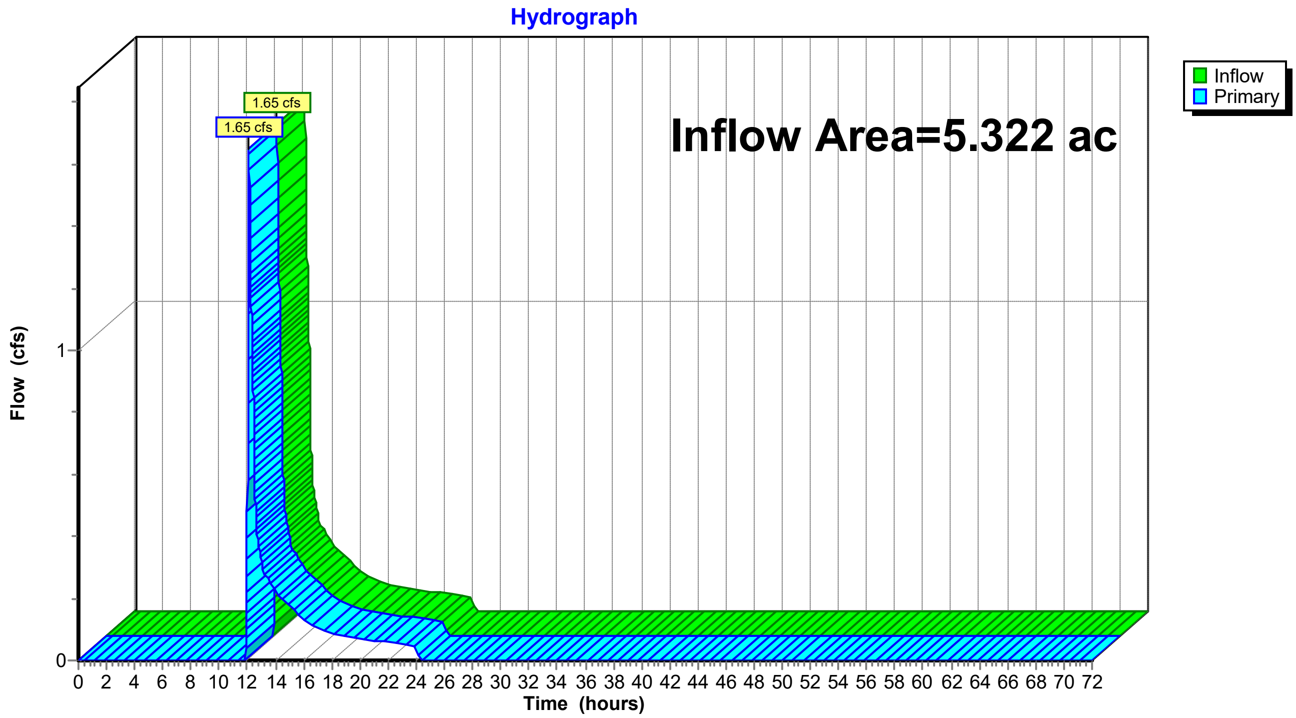


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.322 ac,	41.12% Impervious,	Inflow Depth = 0.37"	for 1-Year event
Inflow =	1.65 cfs @	12.11 hrs, Volume=	0.166 af	
Primary =	1.65 cfs @	12.11 hrs, Volume=	0.166 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

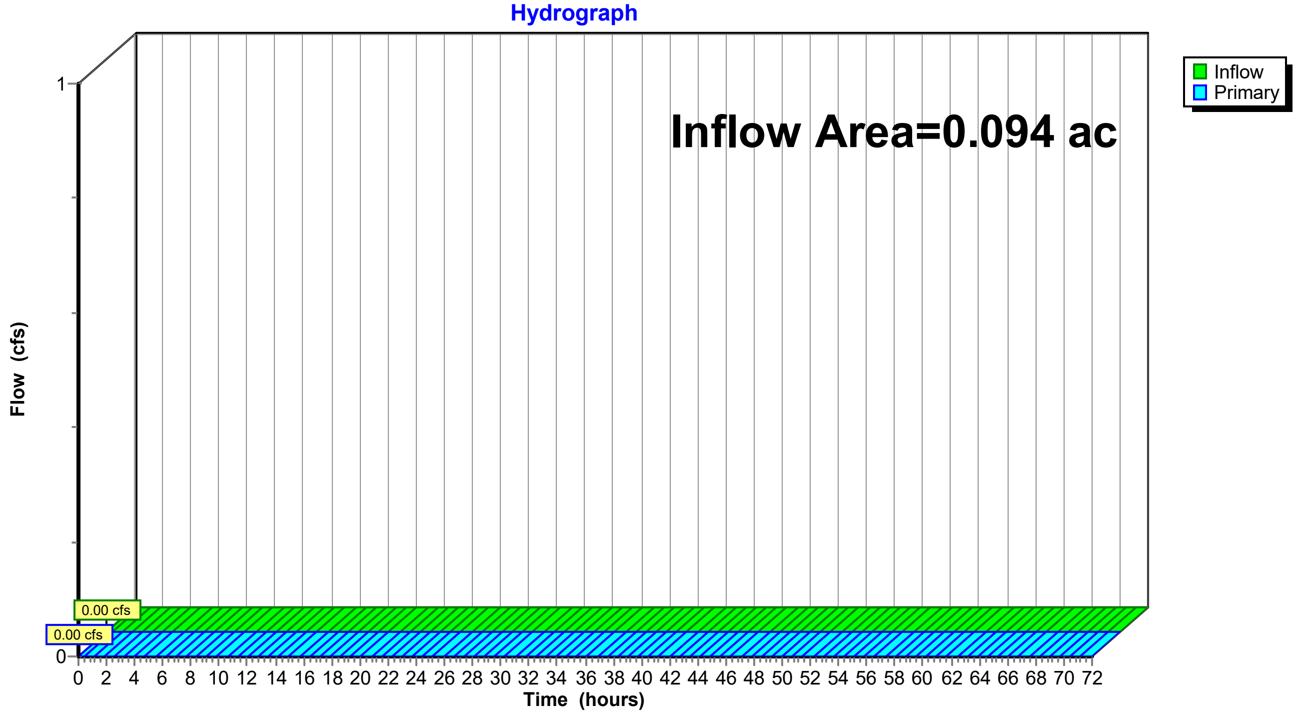


Summary for Link DP-2: Ditch

Inflow Area = 0.094 ac, 0.00% Impervious, Inflow Depth = 0.00" for 1-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A: Subcatchment 1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=0.69"
Tc=6.0 min CN=67 Runoff=3.15 cfs 0.267 af

Subcatchment 1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=1.48"
Tc=6.0 min CN=81 Runoff=1.18 cfs 0.084 af

Subcatchment 2: Subcatchment 2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Pond P1: Porous Pavement Peak Elev=161.40' Storage=1 cf Inflow=1.18 cfs 0.084 af
Discarded=1.17 cfs 0.084 af Primary=0.00 cfs 0.000 af Outflow=1.17 cfs 0.084 af

Link DP-1: Reservoir and Swimming Area Inflow=3.15 cfs 0.267 af
Primary=3.15 cfs 0.267 af

Link DP-2: Ditch Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.352 af Average Runoff Depth = 0.78"
59.60% Pervious = 3.228 ac 40.40% Impervious = 2.188 ac

Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

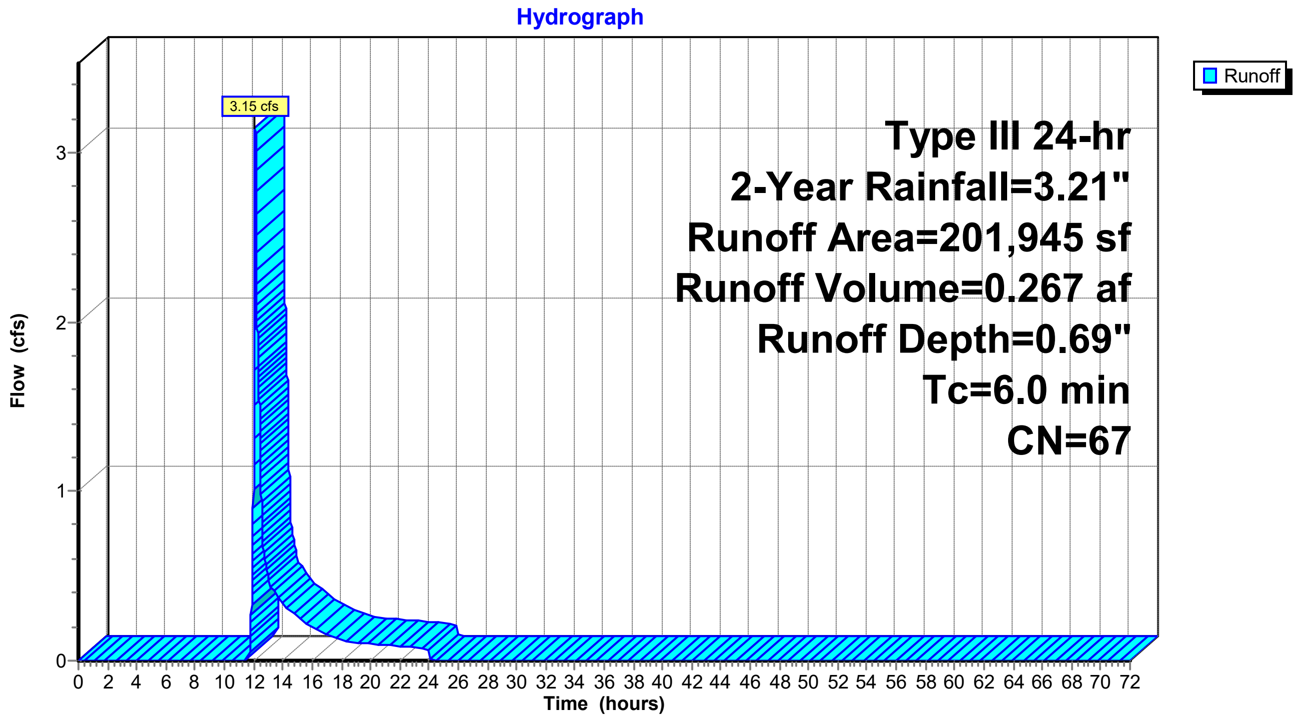
Runoff = 3.15 cfs @ 12.10 hrs, Volume= 0.267 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.21"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

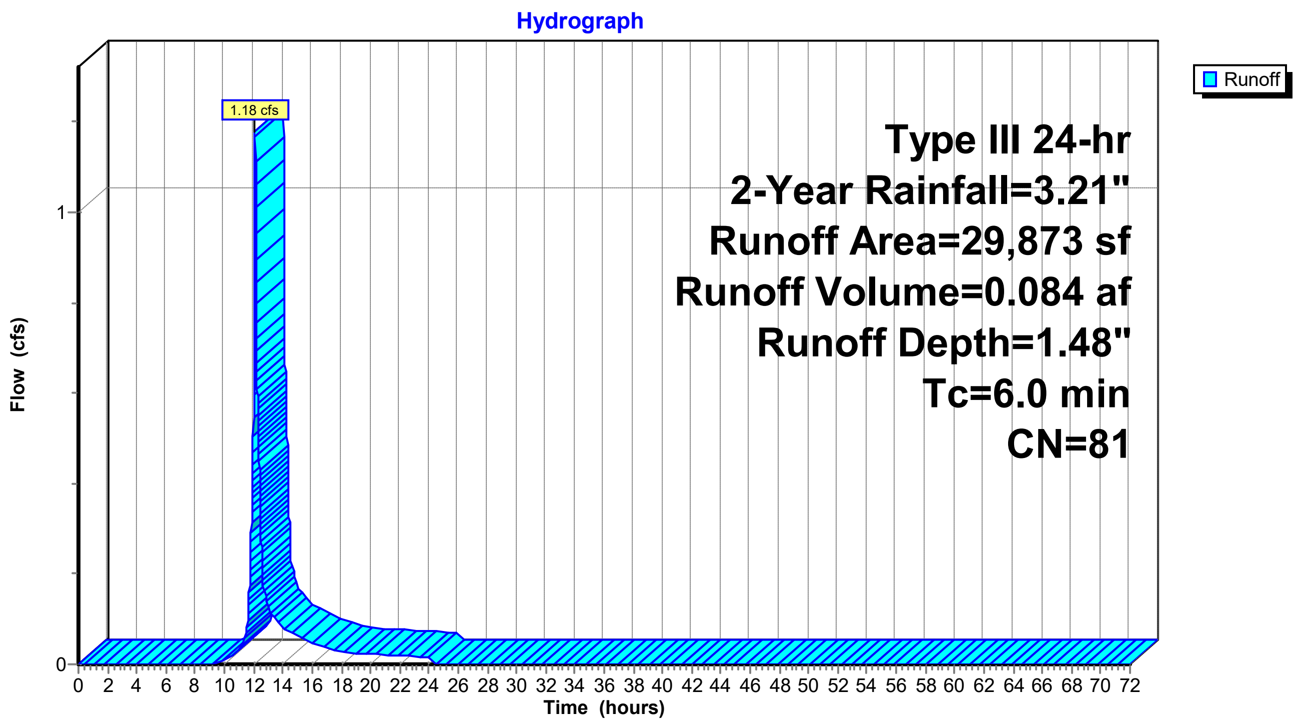
Runoff = 1.18 cfs @ 12.09 hrs, Volume= 0.084 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.21"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

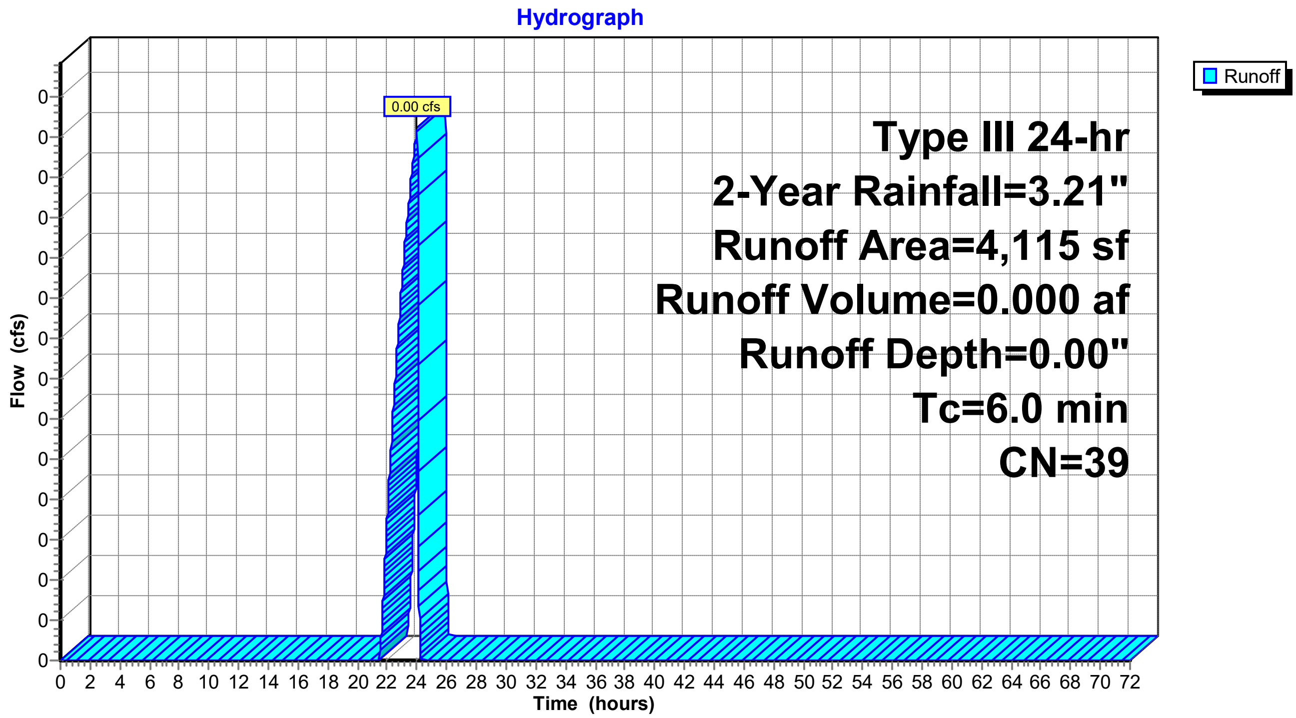
Runoff = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.21"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=547)

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 1.48" for 2-Year event
Inflow = 1.18 cfs @ 12.09 hrs, Volume= 0.084 af
Outflow = 1.17 cfs @ 12.10 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.4 min
Discarded = 1.17 cfs @ 12.10 hrs, Volume= 0.084 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.40' @ 12.10 hrs Surf.Area= 21,411 sf Storage= 1 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (839.4 - 839.4)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

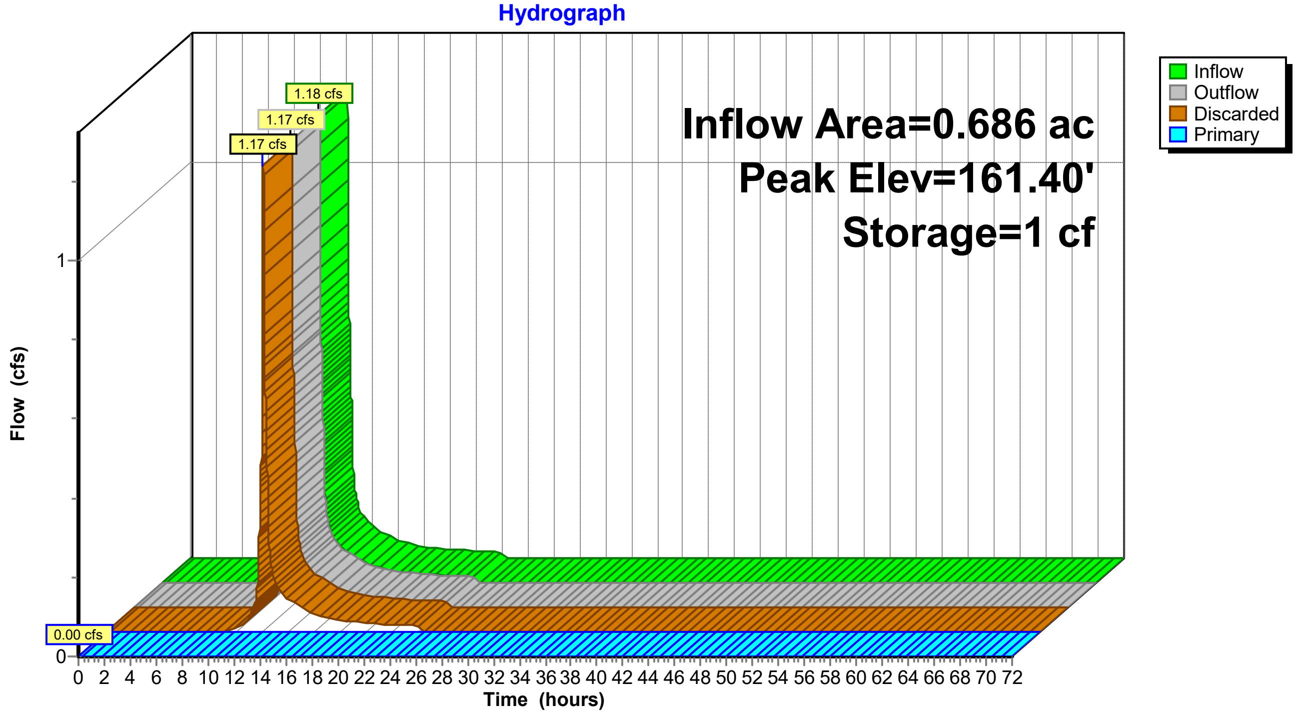
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.10 hrs HW=161.40' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

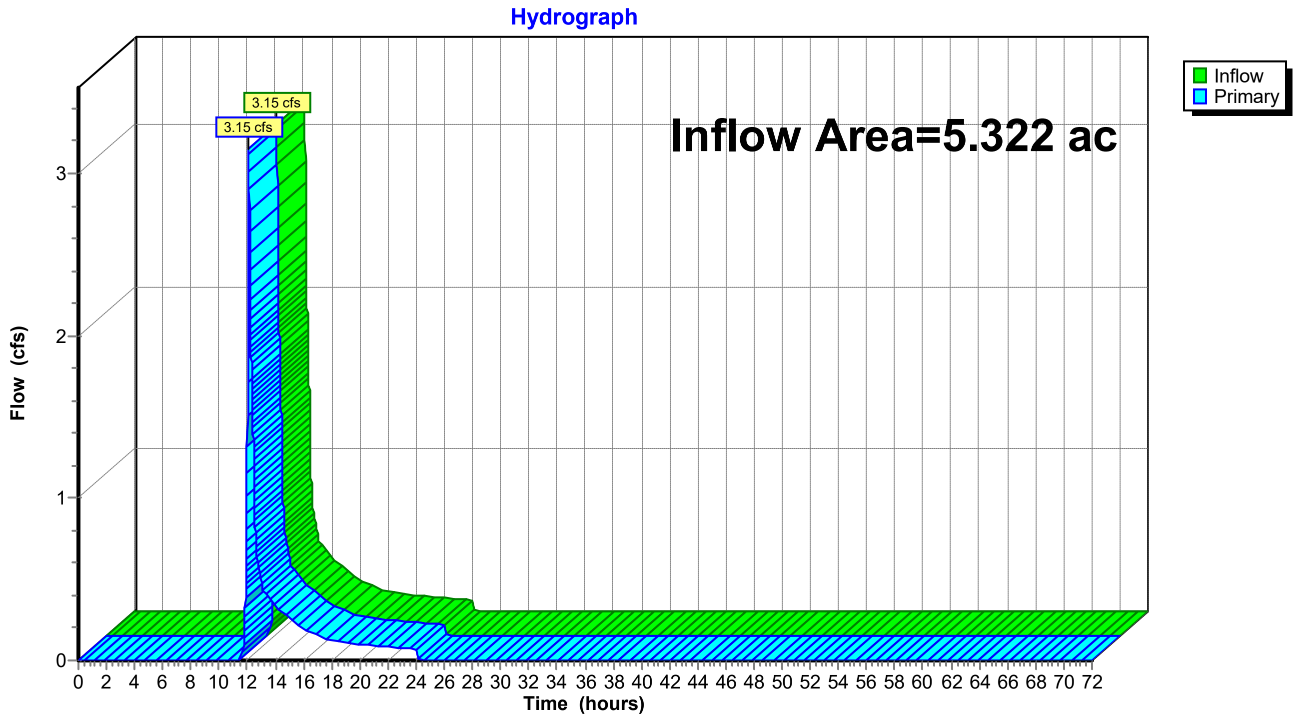


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.322 ac,	41.12% Impervious,	Inflow Depth = 0.60"	for 2-Year event
Inflow =	3.15 cfs @	12.10 hrs, Volume=	0.267 af	
Primary =	3.15 cfs @	12.10 hrs, Volume=	0.267 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

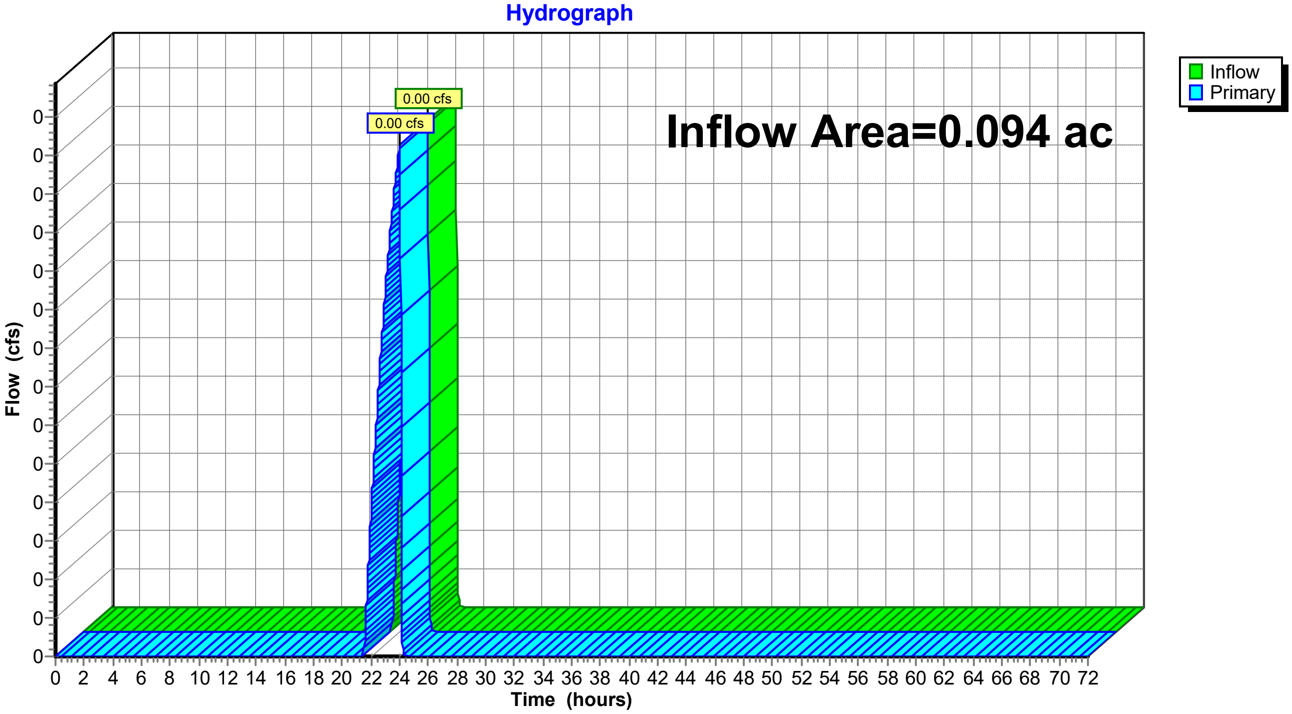


Summary for Link DP-2: Ditch

Inflow Area = 0.094 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A: Subcatchment 1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=1.71"
Tc=6.0 min CN=67 Runoff=8.92 cfs 0.659 af

Subcatchment 1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=2.86"
Tc=6.0 min CN=81 Runoff=2.30 cfs 0.164 af

Subcatchment 2: Subcatchment 2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.17"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.001 af

Pond P1: Porous Pavement Peak Elev=161.46' Storage=515 cf Inflow=2.30 cfs 0.164 af
Discarded=1.19 cfs 0.164 af Primary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.164 af

Link DP-1: Reservoir and Swimming Area Inflow=8.92 cfs 0.659 af
Primary=8.92 cfs 0.659 af

Link DP-2: Ditch Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.824 af Average Runoff Depth = 1.83"
59.60% Pervious = 3.228 ac 40.40% Impervious = 2.188 ac

Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

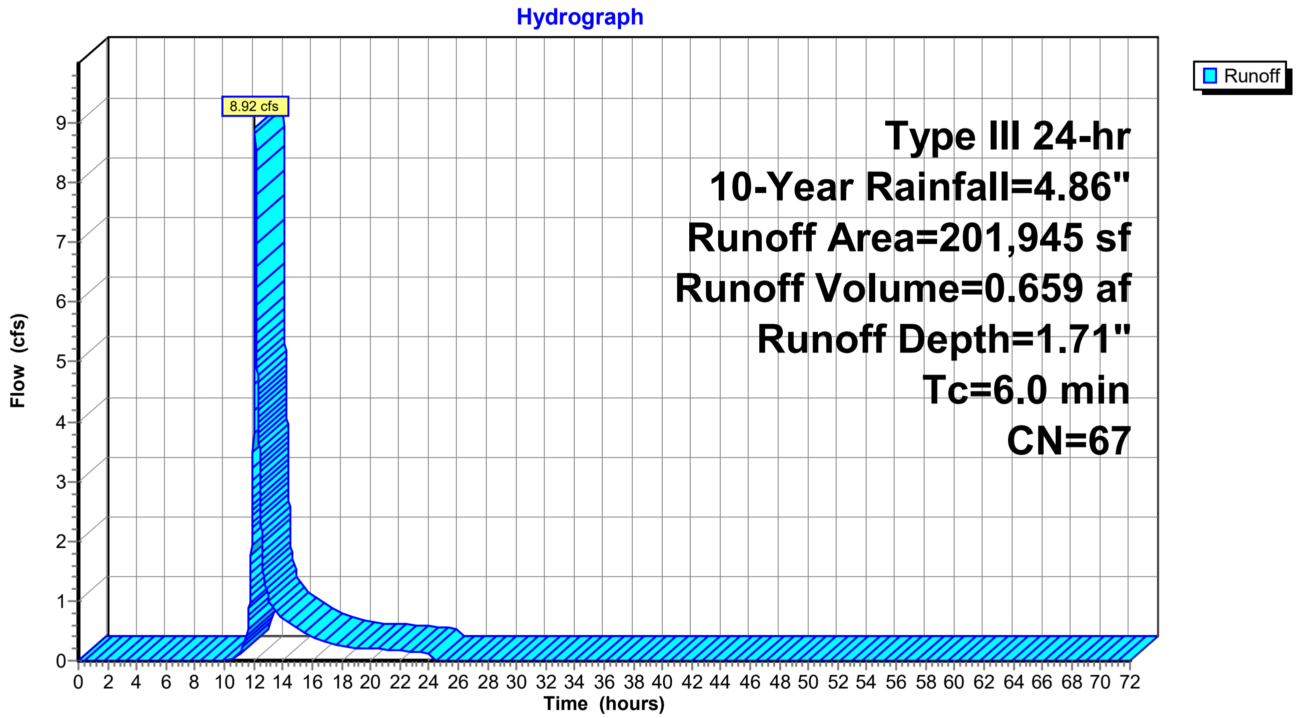
Runoff = 8.92 cfs @ 12.09 hrs, Volume= 0.659 af, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

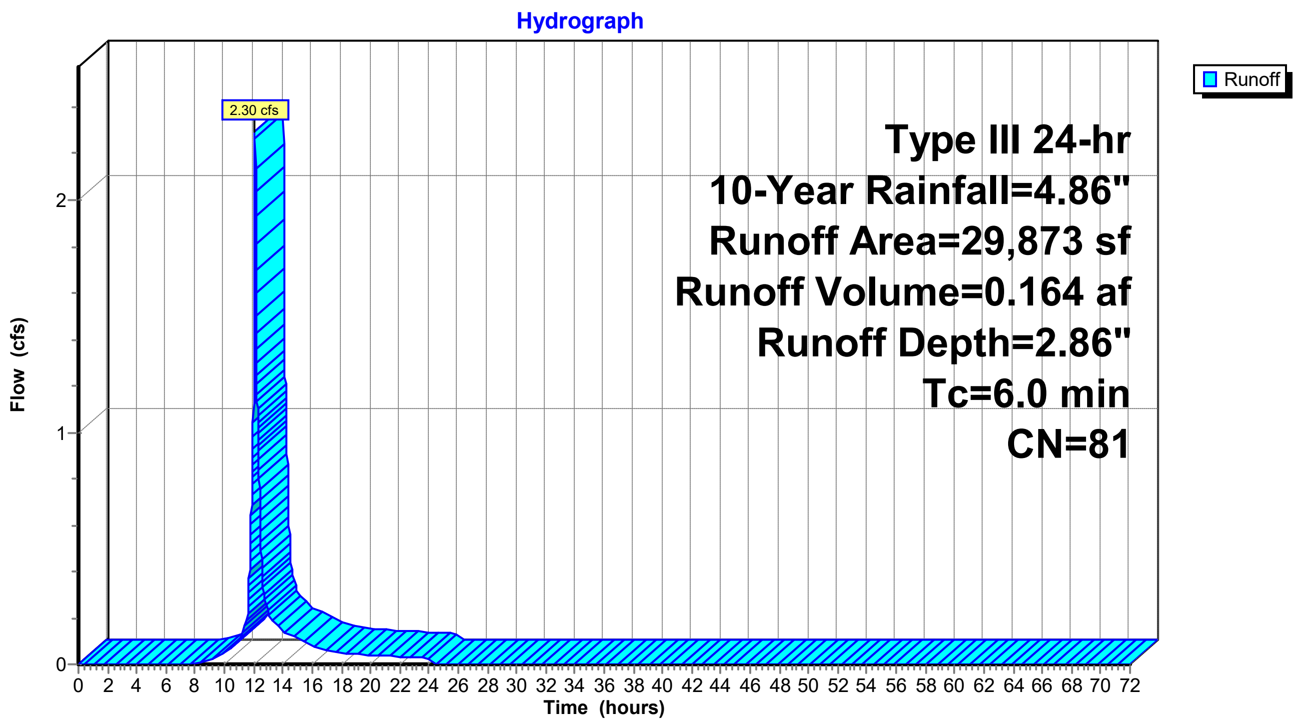
Runoff = 2.30 cfs @ 12.09 hrs, Volume= 0.164 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

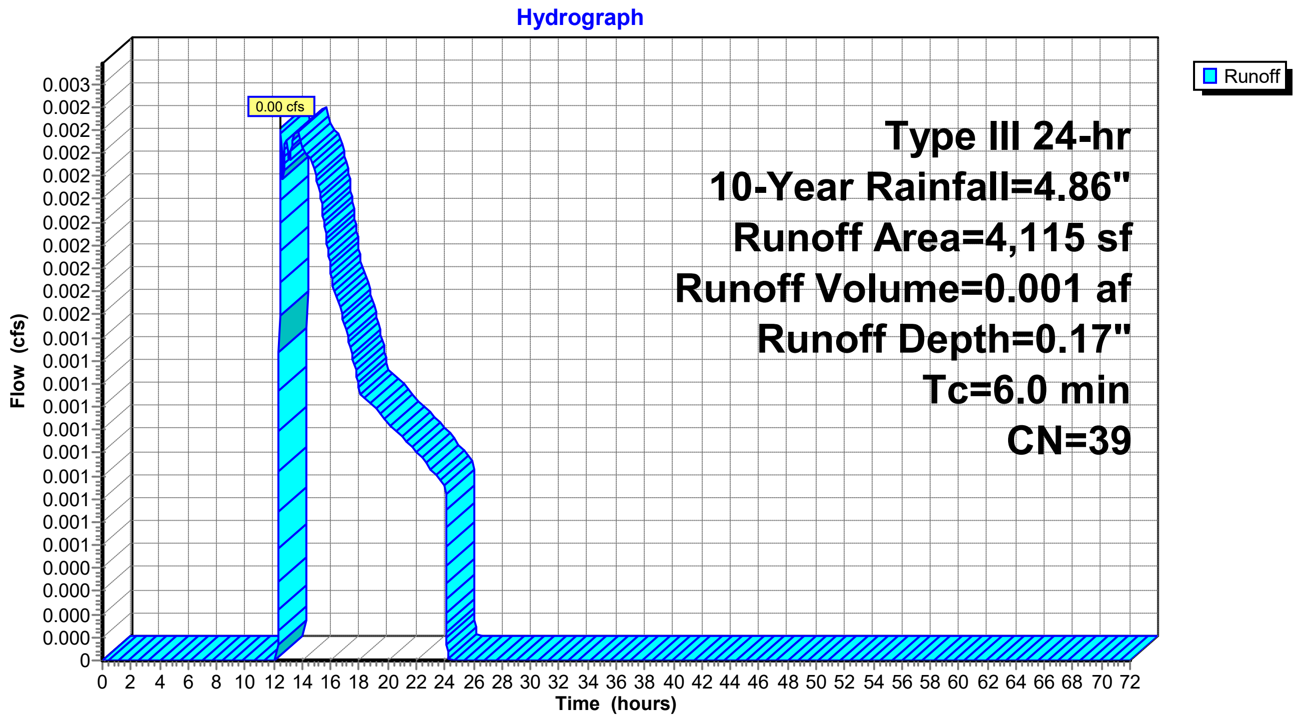
Runoff = 0.00 cfs @ 12.51 hrs, Volume= 0.001 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.86"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=576)

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 2.86" for 10-Year event
Inflow = 2.30 cfs @ 12.09 hrs, Volume= 0.164 af
Outflow = 1.19 cfs @ 12.09 hrs, Volume= 0.164 af, Atten= 48%, Lag= 0.1 min
Discarded = 1.19 cfs @ 12.09 hrs, Volume= 0.164 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.46' @ 12.23 hrs Surf.Area= 21,411 sf Storage= 515 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.6 min (821.9 - 820.3)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

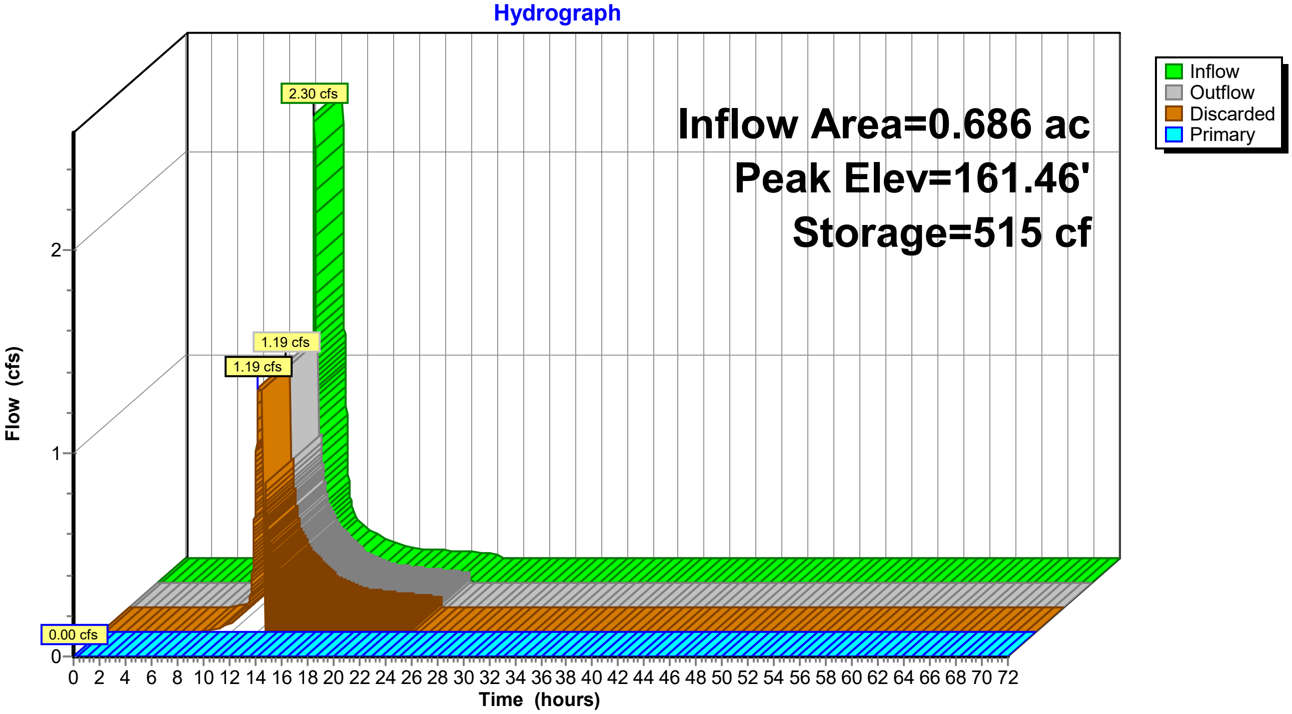
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.09 hrs HW=161.43' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

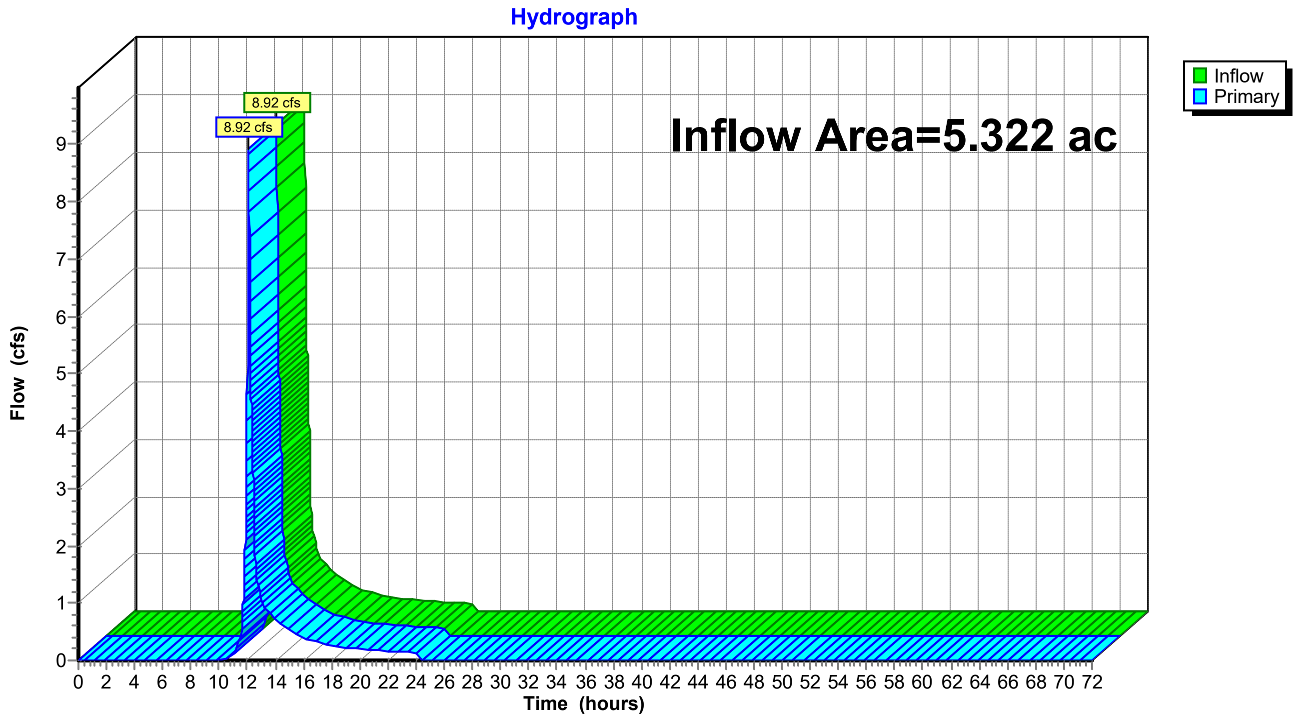


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.322 ac,	41.12% Impervious,	Inflow Depth = 1.49"	for 10-Year event	
Inflow =	8.92 cfs @	12.09 hrs,	Volume=	0.659 af	
Primary =	8.92 cfs @	12.09 hrs,	Volume=	0.659 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

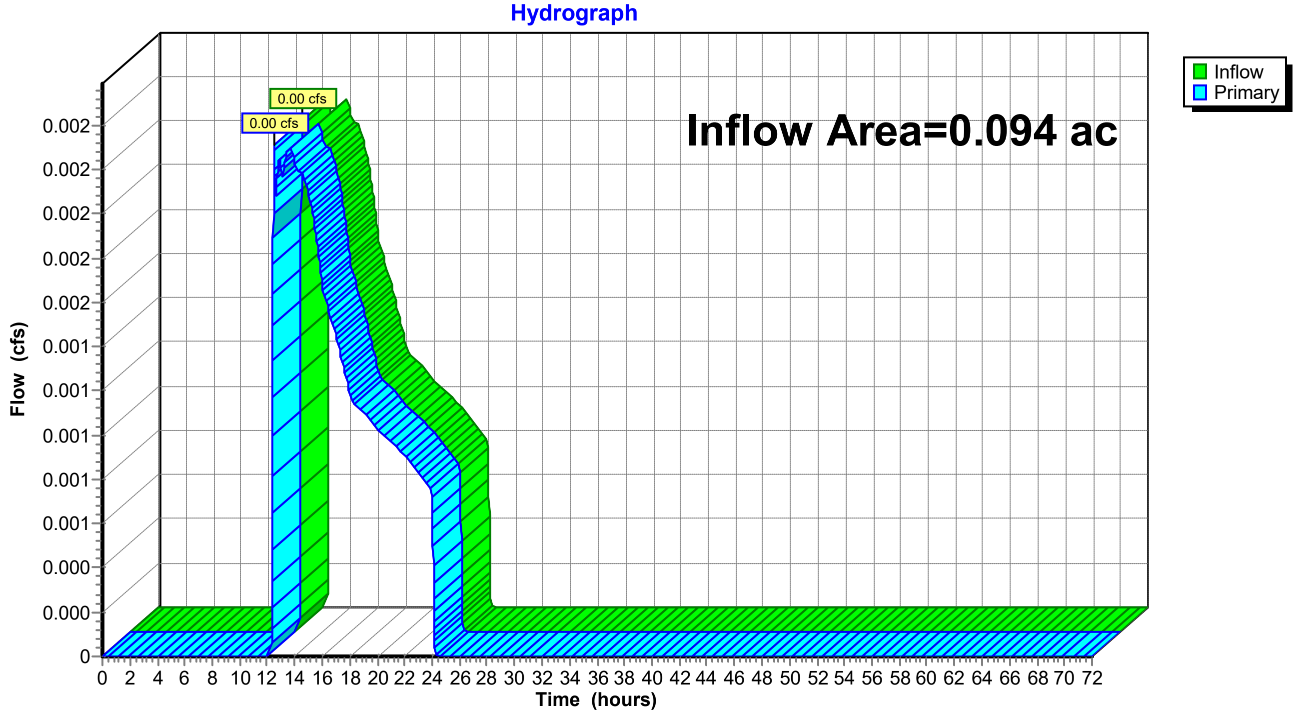


Summary for Link DP-2: Ditch

Inflow Area =	0.094 ac,	0.00% Impervious, Inflow Depth = 0.17"	for 10-Year event	
Inflow =	0.00 cfs @	12.51 hrs, Volume=	0.001 af	
Primary =	0.00 cfs @	12.51 hrs, Volume=	0.001 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A: Subcatchment 1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=2.66"
Tc=6.0 min CN=67 Runoff=14.29 cfs 1.027 af

Subcatchment 1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=4.04"
Tc=6.0 min CN=81 Runoff=3.22 cfs 0.231 af

Subcatchment 2: Subcatchment 2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.50"
Tc=6.0 min CN=39 Runoff=0.02 cfs 0.004 af

Pond P1: Porous Pavement Peak Elev=161.55' Storage=1,280 cf Inflow=3.22 cfs 0.231 af
Discarded=1.19 cfs 0.231 af Primary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.231 af

Link DP-1: Reservoir and Swimming Area Inflow=14.29 cfs 1.027 af
Primary=14.29 cfs 1.027 af

Link DP-2: Ditch Inflow=0.02 cfs 0.004 af
Primary=0.02 cfs 0.004 af

Total Runoff Area = 5.416 ac Runoff Volume = 1.262 af Average Runoff Depth = 2.80"
59.60% Pervious = 3.228 ac 40.40% Impervious = 2.188 ac

Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

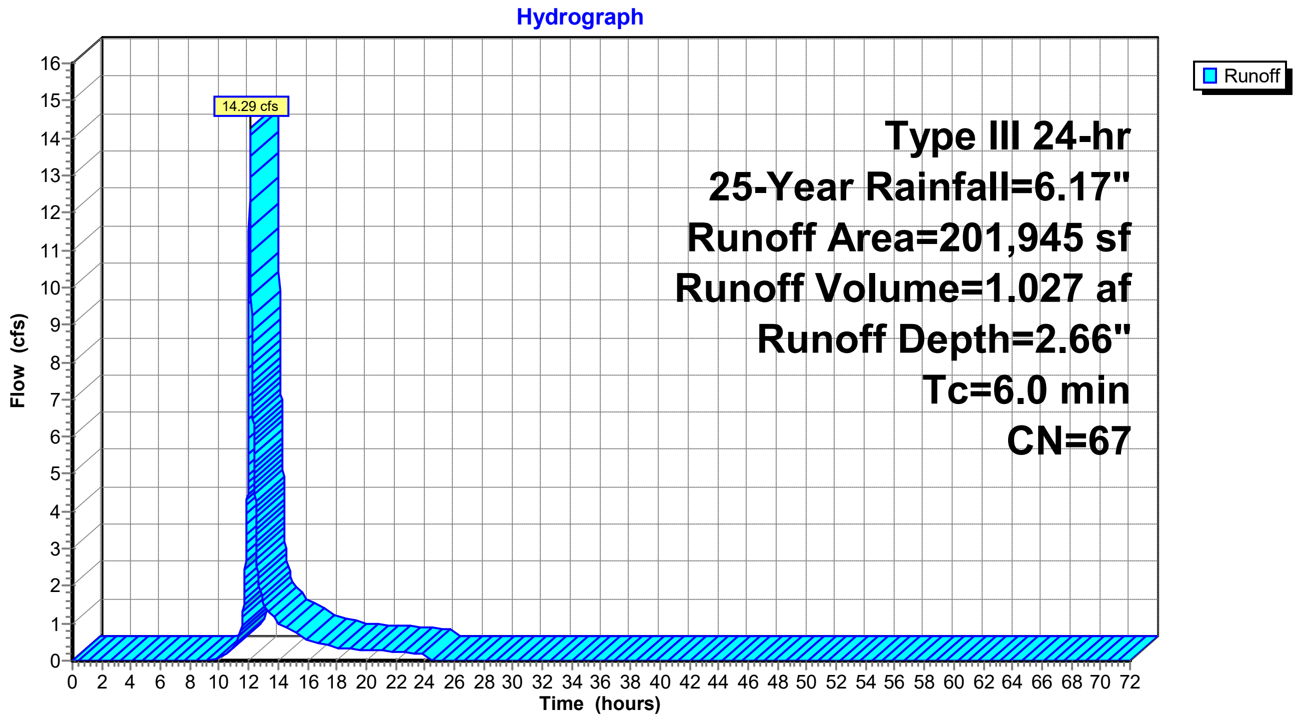
Runoff = 14.29 cfs @ 12.09 hrs, Volume= 1.027 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.17"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

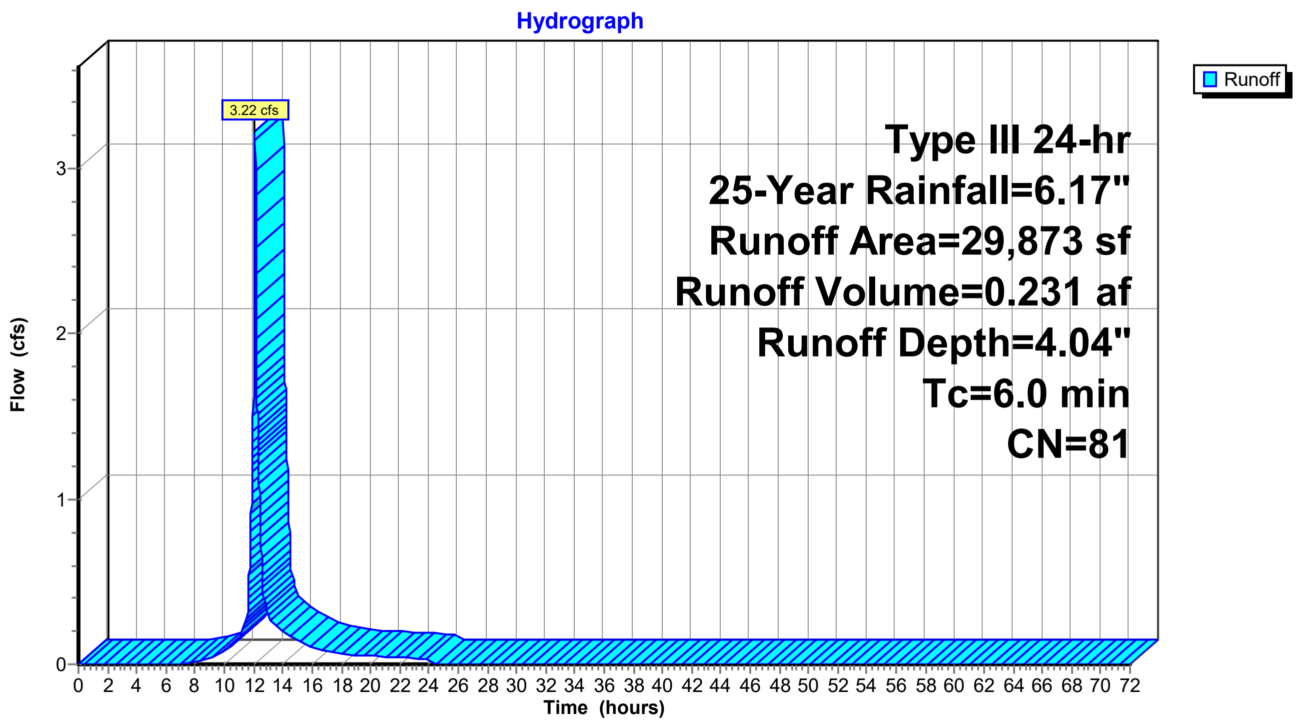
Runoff = 3.22 cfs @ 12.09 hrs, Volume= 0.231 af, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.17"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

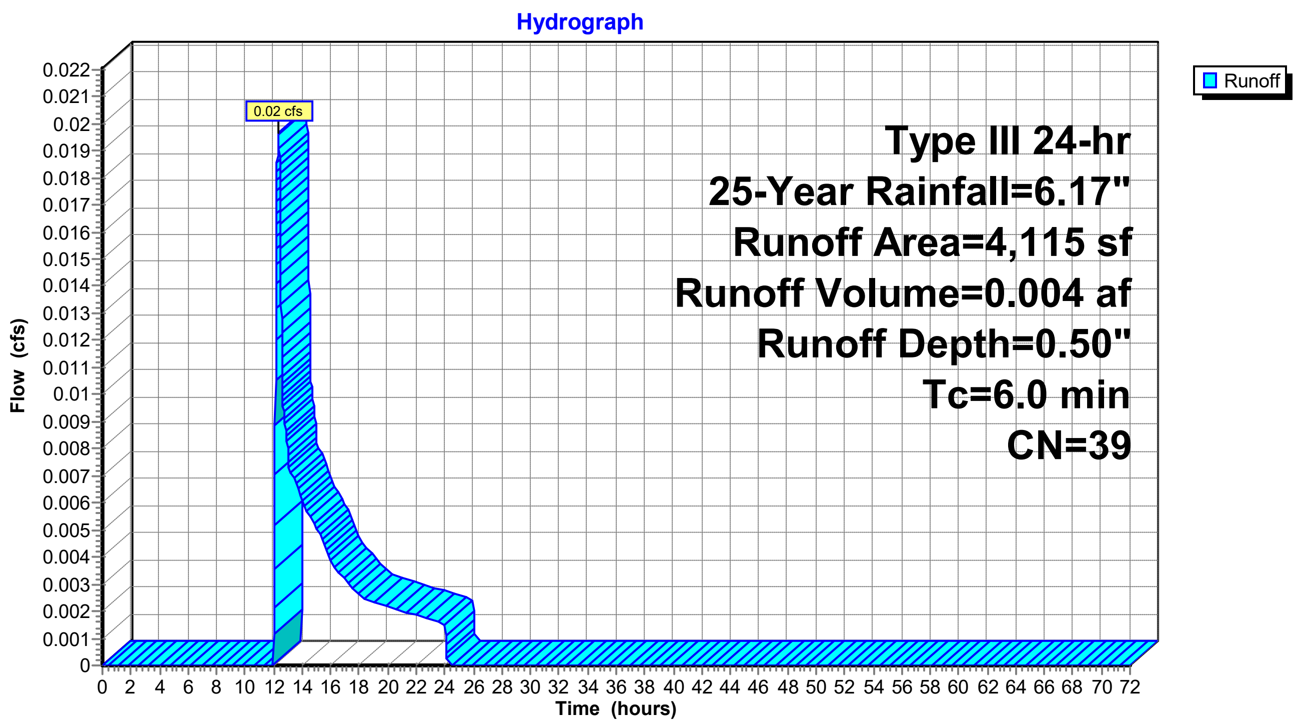
Runoff = 0.02 cfs @ 12.33 hrs, Volume= 0.004 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.17"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=560)

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 4.04" for 25-Year event
Inflow = 3.22 cfs @ 12.09 hrs, Volume= 0.231 af
Outflow = 1.19 cfs @ 12.04 hrs, Volume= 0.231 af, Atten= 63%, Lag= 0.0 min
Discarded = 1.19 cfs @ 12.04 hrs, Volume= 0.231 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.55' @ 12.35 hrs Surf.Area= 21,411 sf Storage= 1,280 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 4.6 min (815.0 - 810.4)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

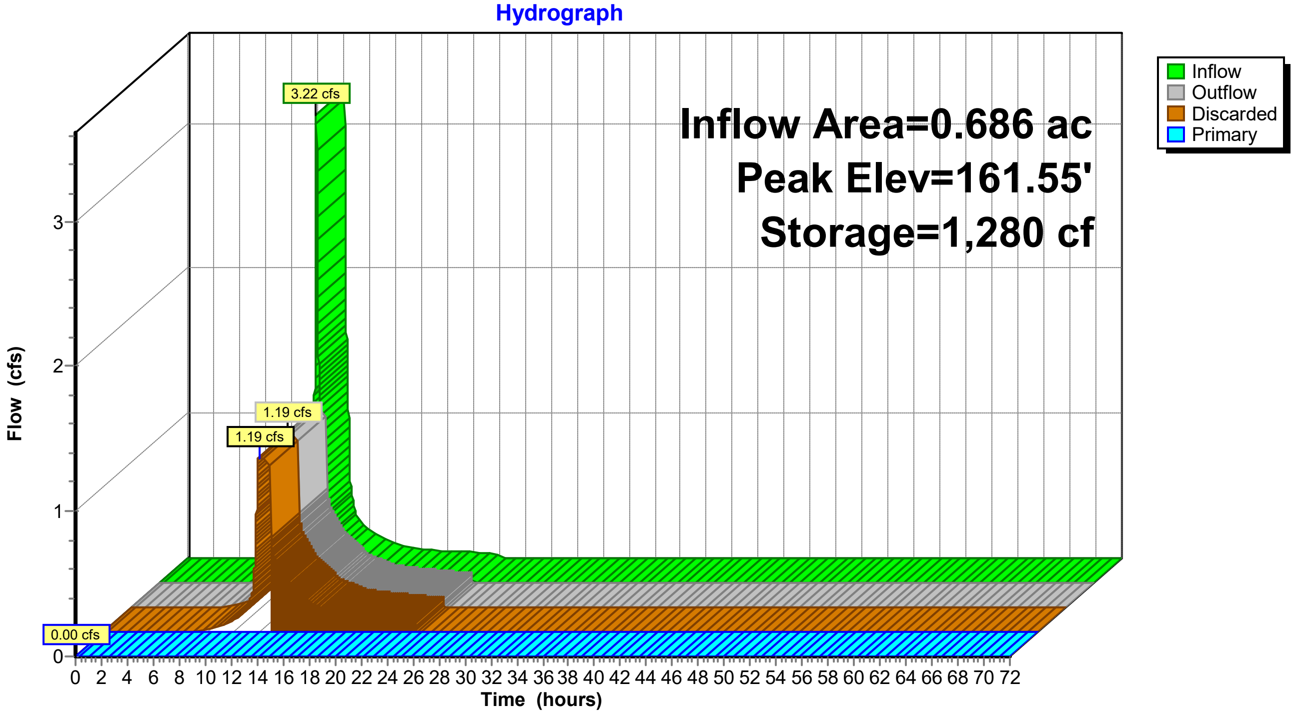
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.04 hrs HW=161.43' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

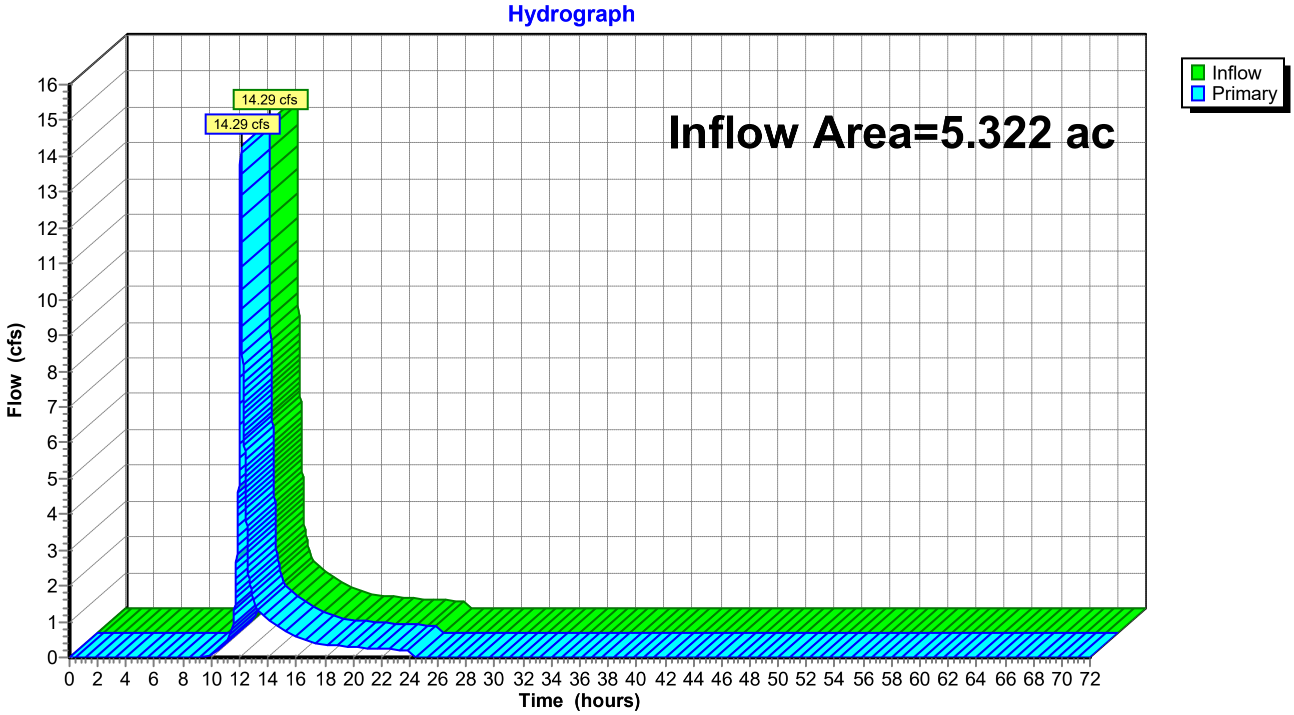


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.322 ac,	41.12% Impervious,	Inflow Depth = 2.32"	for 25-Year event
Inflow =	14.29 cfs @	12.09 hrs, Volume=	1.027 af	
Primary =	14.29 cfs @	12.09 hrs, Volume=	1.027 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

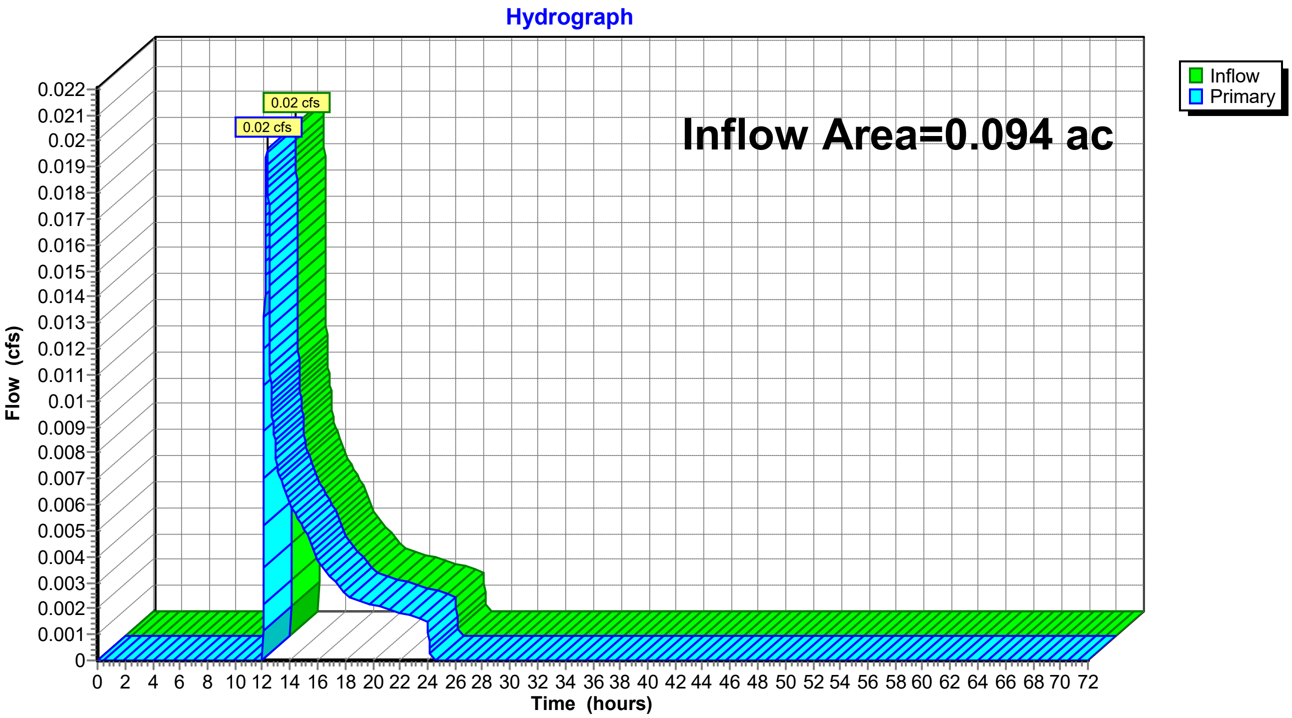


Summary for Link DP-2: Ditch

Inflow Area = 0.094 ac, 0.00% Impervious, Inflow Depth = 0.50" for 25-Year event
Inflow = 0.02 cfs @ 12.33 hrs, Volume= 0.004 af
Primary = 0.02 cfs @ 12.33 hrs, Volume= 0.004 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A: Subcatchment 1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=4.84"
Tc=6.0 min CN=67 Runoff=26.30 cfs 1.868 af

Subcatchment 1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=6.55"
Tc=6.0 min CN=81 Runoff=5.13 cfs 0.374 af

Subcatchment 2: Subcatchment 2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=1.53"
Tc=6.0 min CN=39 Runoff=0.13 cfs 0.012 af

Pond P1: Porous Pavement Peak Elev=161.81' Storage=3,521 cf Inflow=5.13 cfs 0.374 af
Discarded=1.19 cfs 0.374 af Primary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.374 af

Link DP-1: Reservoir and Swimming Area Inflow=26.30 cfs 1.868 af
Primary=26.30 cfs 1.868 af

Link DP-2: Ditch Inflow=0.13 cfs 0.012 af
Primary=0.13 cfs 0.012 af

Total Runoff Area = 5.416 ac Runoff Volume = 2.255 af Average Runoff Depth = 5.00"
59.60% Pervious = 3.228 ac 40.40% Impervious = 2.188 ac

Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

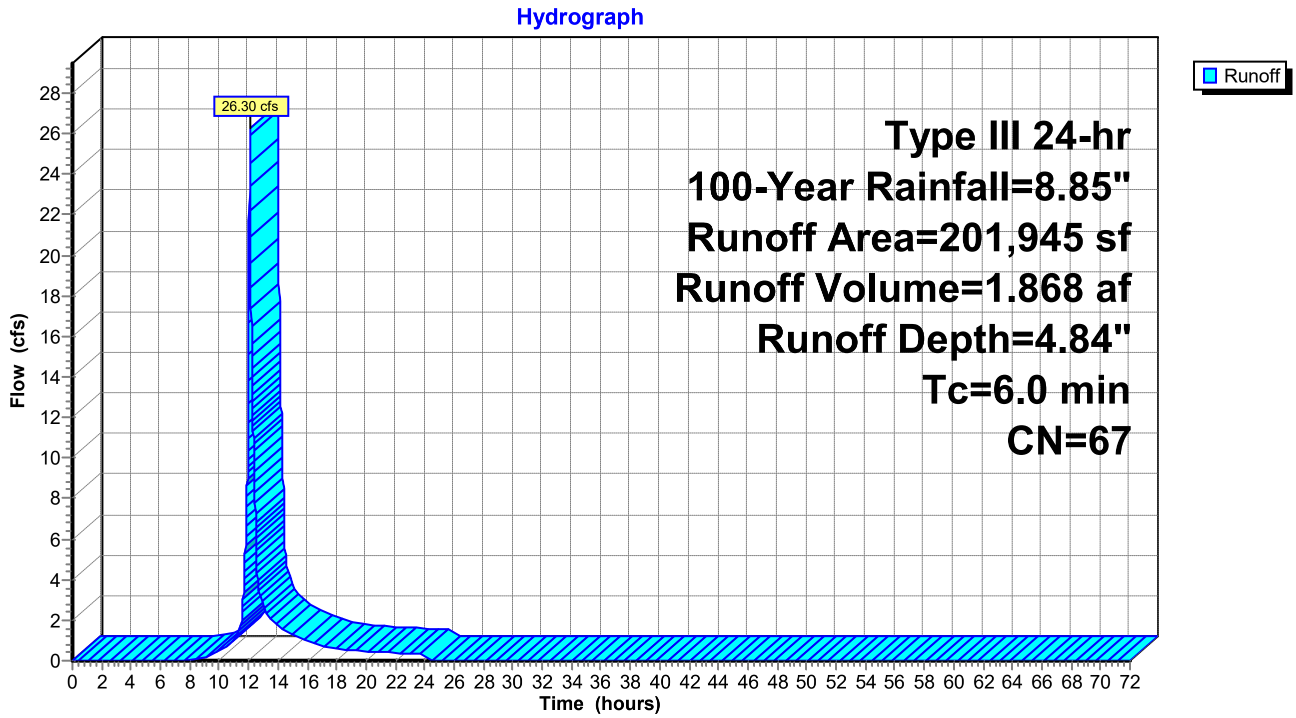
Runoff = 26.30 cfs @ 12.09 hrs, Volume= 1.868 af, Depth= 4.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.85"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

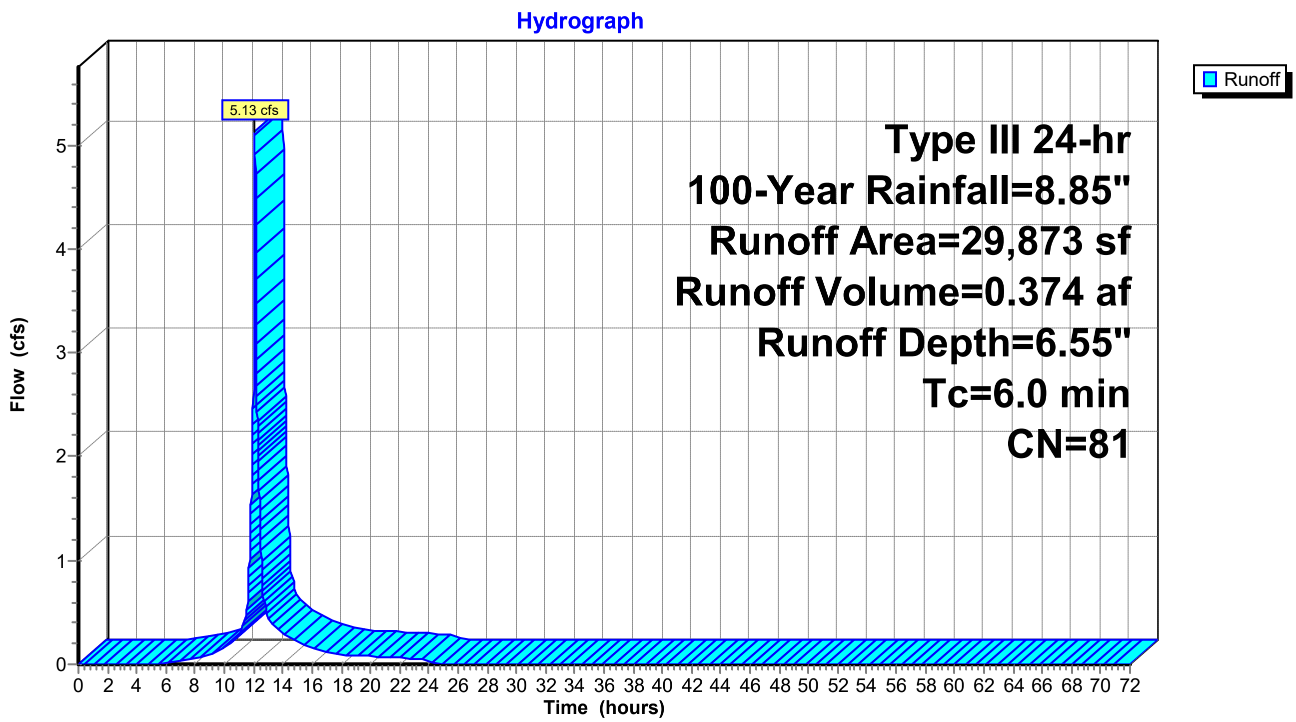
Runoff = 5.13 cfs @ 12.09 hrs, Volume= 0.374 af, Depth= 6.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.85"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

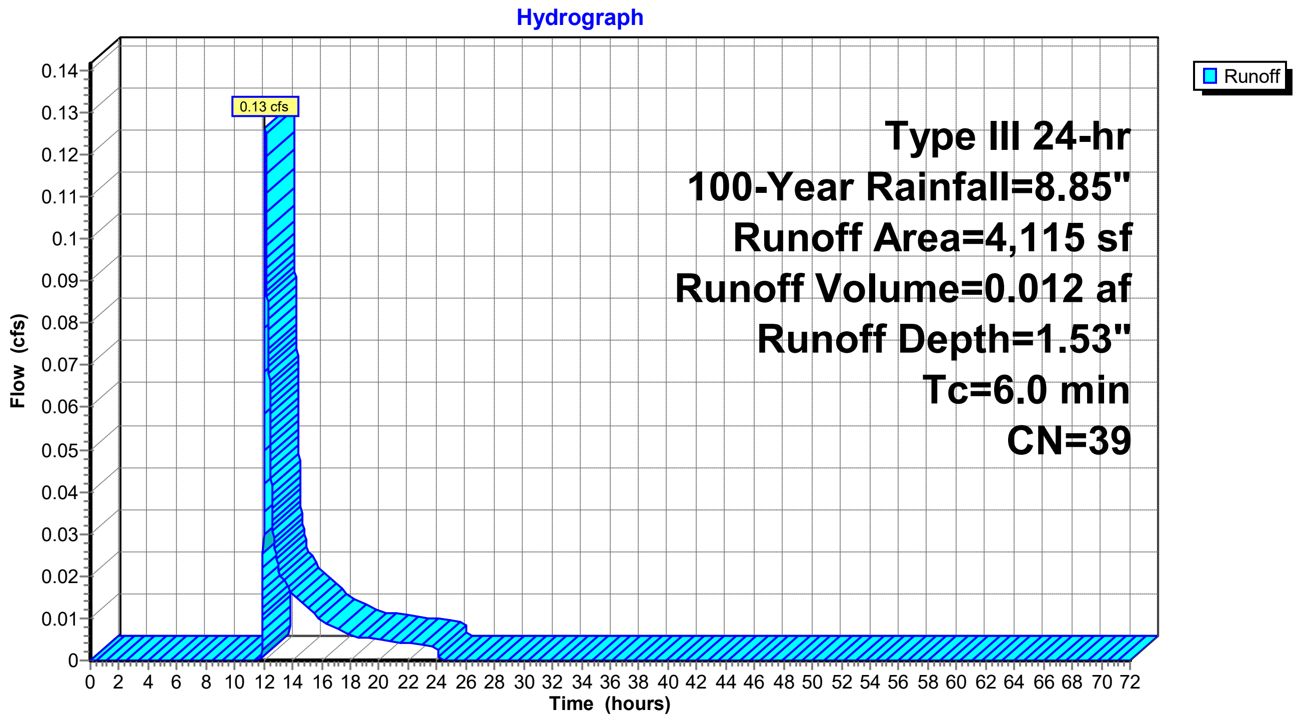
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 0.012 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.85"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=514)

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 6.55" for 100-Year event
Inflow = 5.13 cfs @ 12.09 hrs, Volume= 0.374 af
Outflow = 1.19 cfs @ 11.92 hrs, Volume= 0.374 af, Atten= 77%, Lag= 0.0 min
Discarded = 1.19 cfs @ 11.92 hrs, Volume= 0.374 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.81' @ 12.48 hrs Surf.Area= 21,411 sf Storage= 3,521 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 14.9 min (811.7 - 796.9)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

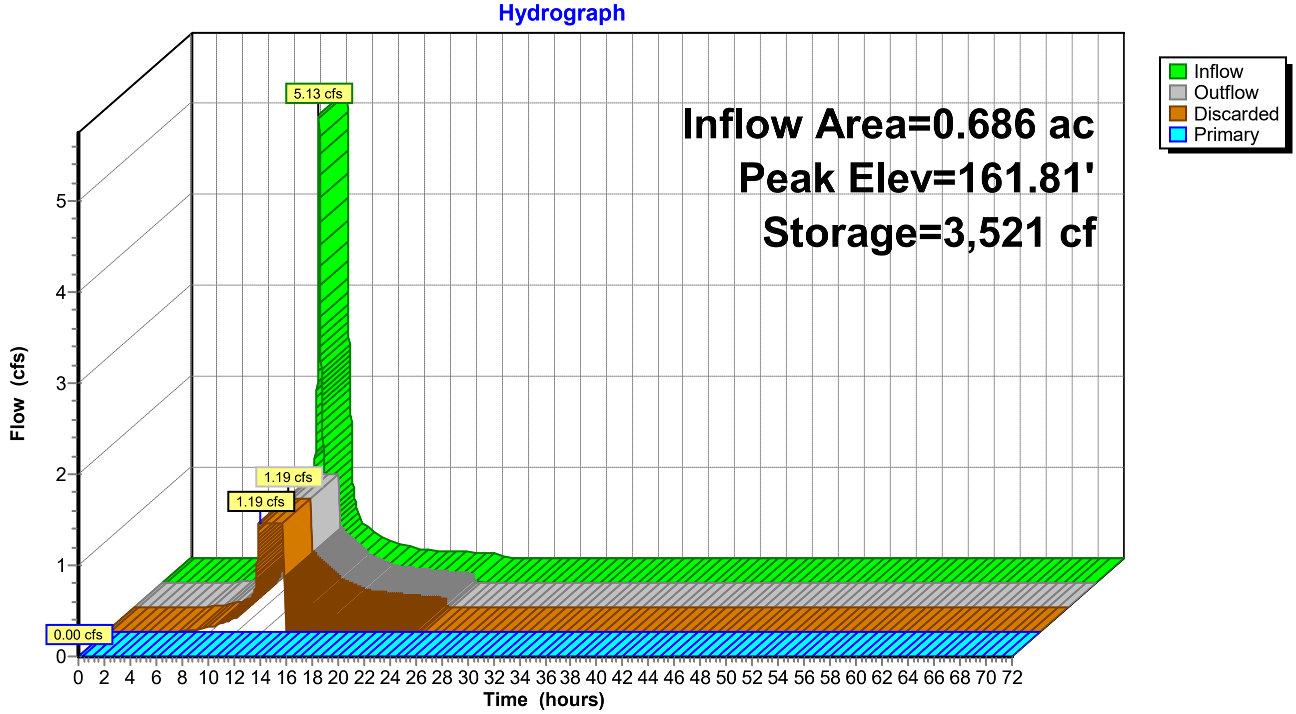
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 11.92 hrs HW=161.43' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

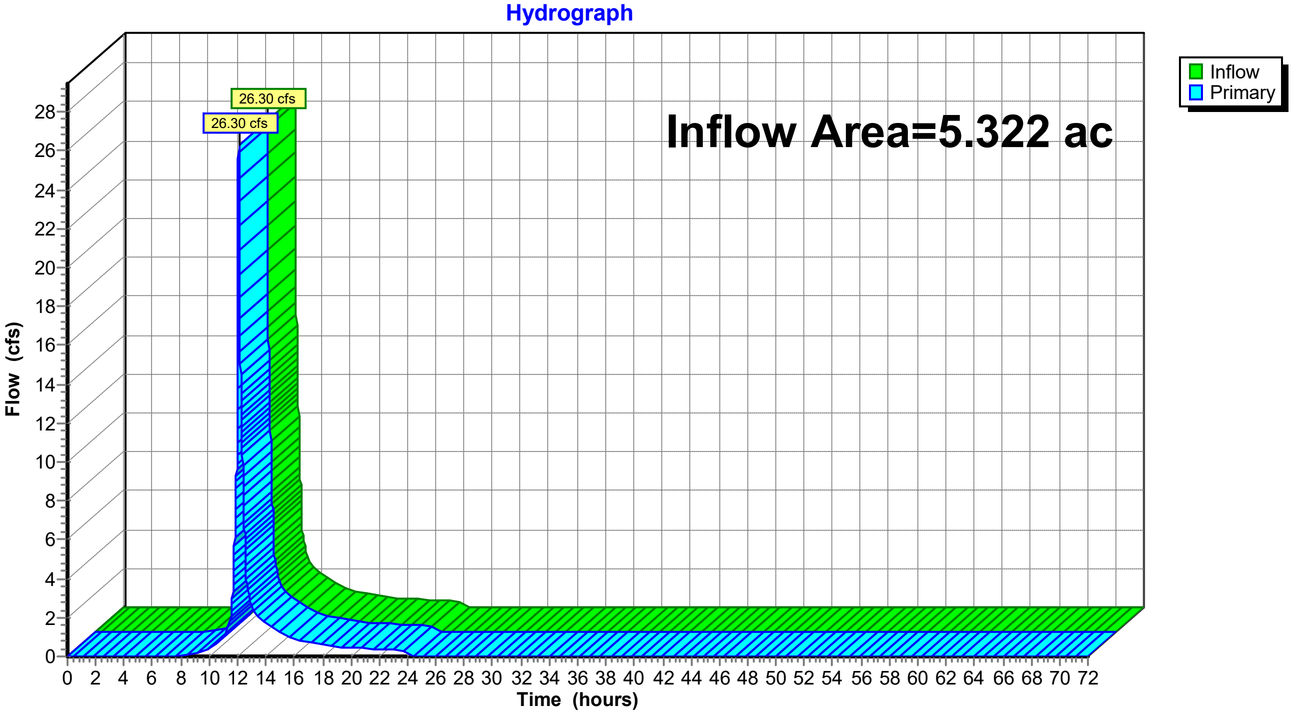


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.322 ac, 41.12% Impervious, Inflow Depth = 4.21" for 100-Year event
Inflow = 26.30 cfs @ 12.09 hrs, Volume= 1.868 af
Primary = 26.30 cfs @ 12.09 hrs, Volume= 1.868 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

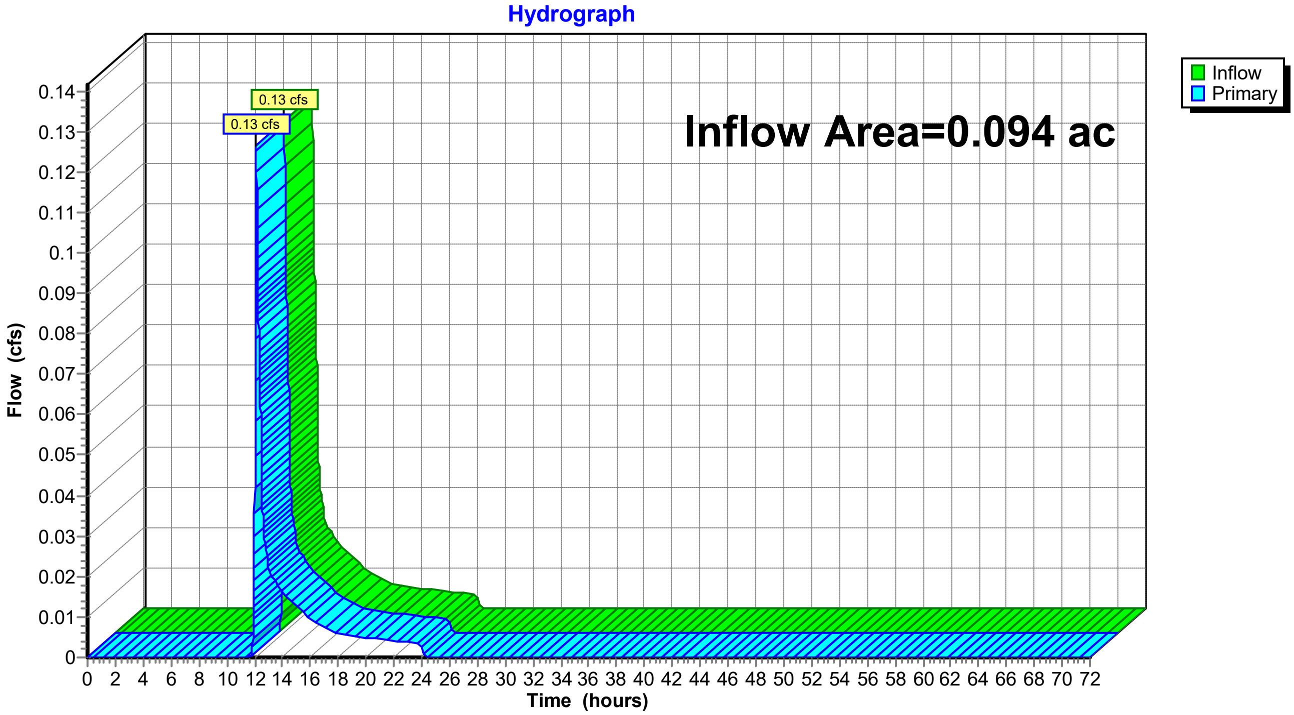


Summary for Link DP-2: Ditch

Inflow Area =	0.094 ac,	0.00% Impervious,	Inflow Depth = 1.53"	for 100-Year event
Inflow =	0.13 cfs @	12.11 hrs, Volume=	0.012 af	
Primary =	0.13 cfs @	12.11 hrs, Volume=	0.012 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



APPENDIX E: OPERATIONS & MAINTENANCE PLAN

STORMWATER MANAGEMENT SYSTEM
OPERATION & MAINTENANCE PLAN

This Stormwater Management System Operations & Maintenance Plan (the Plan) outlines measures that are essential for maintaining an effective stormwater management system at the Arlington Reservoir, located at 210 Lowell Street in Arlington, Massachusetts (the Site). Periodic and scheduled inspections and maintenance measures are recommended to prevent deficiencies and for proper performance of the stormwater management system. Failure to implement these measures can reduce the hydraulic capacity and the pollutant removal efficiency of stormwater measures resulting in a poor quality of stormwater runoff discharging from the Site.

RESPONSIBLE PARTY & ESTIMATED ANNUAL BUDGET

The party responsible for implementing this Plan and identifying the source of necessary funds is as follows:

Town of Arlington, Massachusetts – Department of Public Works
51 Grove Street
Arlington, MA 02476
Telephone: (781) 316-3301

GOOD HOUSEKEEPING

The Site will be maintained as clean and orderly. Routine inspections of the Site for debris and sediment accumulations shall be performed. Debris and sediment shall be disposed of in accordance with local and State requirements.

INSPECTIONS & MAINTENANCE MEASURES

Stormwater management is provided by porous pavement sections, as illustrated on the Site Plans. Routine inspections and maintenance of the stormwater management system shall be performed in accordance with this Operation & Maintenance Plan. These measures are recommended to prevent deficiencies within the system that may result in poor quality of stormwater runoff.

A sample Inspection Form is attached and is recommended for use during inspections of the stormwater management system. The form includes a table that outlines specific inspection and maintenance measures, in addition to the following information that can be recorded by the inspector during the inspection. Completed Inspections Forms shall be kept at the Site to enable both Department of Public Works staff members and regulatory agencies to ensure that operation of the system is in compliance with this Operation & Maintenance Plan.

SOLID WASTE CONTAINMENT

Trash and recycling receptacles will be provided throughout the Site, as necessary. Receptacles should remain covered to prevent exposure with stormwater and to ensure waste will remain inside the receptacle. Waste collection must be performed regularly.

LANDSCAPE MANAGEMENT

Lawn and landscaped areas shall be inspected for patches of dead vegetation and erosion. If these conditions are observed, affected areas shall be stabilized and replanted with vegetation to prevent sediment from entering the stormwater management system.

The following measures shall be followed to minimize the potential for stormwater runoff pollution due to overwatering, dead vegetation and erosion, direct disposal of lawn clippings, and over-application of materials such as fertilizers and pesticides.

<u>Lawn Mowing</u>

The following mowing practices are recommended:

- Maintain sharp mower blades.

- Typically, avoid cutting grass shorter than 2 to 3 inches in height, to minimize weed growth. Grass can be cut lower in the spring and fall to stimulate root growth but should not be cut shorter than $1^{1}/_{2}$ inches.
- Do not dispose of grass clippings within the stormwater management system.
- Employ practices to minimize the potential for grass clippings to enter the stormwater management system.

Fertilizers & Pesticides

Use of pesticides and fertilizers should be minimized to the extent practicable. Application of these materials may degrade the quality of stormwater runoff and should therefore be applied cautiously. In addition, fertilizers and pesticides shall not be applied prior to rain events. These materials should be stored under cover to prevent their exposure to stormwater.

PERVIOUS AREA MANAGEMENT

Winter Operations

Remove accumulated snow after winter storm events to keep the site's parking lots open for operations and maintenance activities. Snow shall not be stored within pervious areas.

Plows with poly cutting blades are required for snow removal. With their use, no alterations to typical snow removal activities are required. Sand will prematurely clog the porous pavement system and should not be used for deicing. Magnesium Chloride is an alternative material that can be used for deicing, if necessary. Snow melts faster on porous pavement than traditional pavement, as melting water does not remain on the surface to insulate the remaining ice.

Pervious Pavement

The pervious pavement system shall be monitored for permeability and maintained with an industrial wet vacuum sweeper at east twice a year or more frequently, as needed. The frequency of cleanings will vary depending on Site conditions including frequency of traffic, local climate, and surrounding environment but should be performed once in the Spring and once in the Fall (after leaves have fallen but before the first snow fall) to assure the pavement's long function life.

Damage to the surface of the porous pavement can be repaired by using a concrete saw to remove the damaged area and installing new porous pavement in its place.

STORMWATER MANAGEMENT SYSTEM INSPECTION FORM

Town of Arlington, Massachusetts
Arlington Reservoir
210 Lowell Street
Arlington, MA 02474

Name of Inspector: ______________________________
Date/Time: ______________________________
Weather: ______________________________
Date of Last Inspection: ______________________________

Items Inspected (refer to Table 1 and provide additional sheets if necessary):

Comments & Corrective Actions Taken (provide additional sheets if necessary):

Table 1 – Operations & Maintenance Measures

Porous Pavement	
Objective: *Maintain the infiltration and storage capacity of the porous pavement section.*	
Frequency	***Measure***
Ongoing/As Needed	• Monitor the surface of the porous pavement to proper drainage is achieved during storm events.
Quarterly	• Remove sediment and organic debris on the porous pavement surface using a vacuum sweeper.
Bi-Annually (once in Spring and once in Fall)	• Inspect the surface of the porous pavement for deterioration or clogging. • Assess the infiltration capacity of the porous pavement sections.
Additional Comments	• Do not stockpile snow on porous pavement surface. This will require additional maintenance and vacuuming. • Do not sand over porous pavement surface.

APPENDIX F: STORMWATER POLLUTION PREVENTION PLAN

APPENDIX G: MASSDEP CHECKLIST FOR STORMWATER REPORT

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

☐ No disturbance to any Wetland Resource Areas

☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)

☒ Reduced Impervious Area (Redevelopment Only)

☒ Minimizing disturbance to existing trees and shrubs

☐ LID Site Design Credit Requested:

- ☐ Credit 1
- ☐ Credit 2
- ☐ Credit 3

☒ Use of "country drainage" versus curb and gutter conveyance and pipe

☐ Bioretention Cells (includes Rain Gardens)

☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)

☐ Treebox Filter

☐ Water Quality Swale

☐ Grass Channel

☐ Green Roof

☐ Other (describe): ____________________

Standard 1: No New Untreated Discharges

☒ No new untreated discharges

☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth

☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☒ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☒ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

  ☐ is within the Zone II or Interim Wellhead Protection Area

  ☐ is near or to other critical areas

  ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)

  ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☐ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☒ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☒ Critical areas and BMPs are identified in the Stormwater Report.

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☒ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☒ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☒ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

WOODARD
&CURRAN

woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

kzla

Notice of Intent – Additional Information
Arlington Reservoir Phase 2 Implementation
30 December 2020

This memo is to address three topics addressing the landscape during the December 17th Conservation Commission hearing:

1. **Stabilized crushed granite path system requested by the Lexington Conservation Commission & representative examples in the area**

   It was mentioned on the site walk held on Friday, September 4, 2020 with members of both the Arlington & Lexington Conservation Commission that the Lexington Conservation Commission does not consider a stabilized stonedust material to be a porous pavement system. The Commission prefers a stabilized crushed granite pavement surface. The difference between the two is in the specifying of a stonedust product which could be comprised of a 3/8" minus crushed quartz-based stone versus a 3/8" minus crushed granite. Both are blended with a water-activated binder.

   Read Custom Soils is a local purveyor (Wareham, MA) of engineered and blended soils who specializes in providing this type of soils, including Organic-Lock (or approved equal). Organic-Lock, is a stabilized product which meets the Lexington requirements. Organic-Lock as provided by Read Custom Soils comes in 5 different colors each sourced from a different quarry. The "natural gray" color is sourced from a West Roxbury granite quarry, and therefore meeting the Lexington Commission's request for stabilized crushed granite.

   It is worth noting that this stabilized pathway system is used in limited area within the Arlington portion of the Res recreation area. The vast majority of the trail encircling the Res is proposed to be comprised of a crushed stone surface with no stabilizer. The grades for most of the pathways are flat enough that the stabilized is not necessary. The only places within Arlington where the stabilized crushed granite system is proposed are:

   a. The sloped walkway connecting Drake Village to the perimeter trail. We have proposed the stabilizer here as the trail connection is just under 5% and we do not want the fine material to move with stormwater.
   b. The pathway connecting the concrete beach walkway along the south embankment of the swimming area. We have proposed the stabilizer in this location as the pathway has water on both sides and we want to be sure the fine material does not wash into either the swimming area or the Res.
   c. The trail which parallels the main parking lot between the lot and the Res. In this location we want to ensure that the 3/8-inch material does not migrate into the porous pavement system. We have also separated the two pavements with a 12-inch flush concrete curb to help separate the systems.

Kyle Zick Landscape Architecture, Inc.

36 Bromfield Street, Suite 202, Boston, MA 02108
t: 617-451-1018 e: kzick@kylezick.com www.kylezick.com

kzla

The most local example of the stabilized crushed granite is at the New Visitor Center at Walden Pond in Concord. The pathways adjacent to the parking lot and around the reconstruction cabin are comprised of stabilized crush granite.
https://www.organic-lock.com/portfolio_page/walden-pond/

Additional information on the stabilized pathway system can be found at:
http://readcustomsoils.com/stabilized-soil/
https://www.organic-lock.com/decomposed-granite-stabilizer/

2. Tree replacements for trees proposed to be removed

Section 24 (Vegetation Removal & Replacement) of the Town's Wetland Protection Regulations requires that trees removed within the Conservation Commission's jurisdiction (resource areas) shall be replaced based on the schedule established on page 35 of the Regulations. We have reflected that schedule on Sheet L1.1 of our plans submitted to the Commission. This schedule shows that there are a total of 25 trees being removed, which requires a replacement of 44 trees based on caliper inch of removal.

Trees are only being removed if they are in a hazard condition or if they will be impacted by the proposed improvements to the extent that they will not survive. Per the project's planting plan (sheets series L4.1-L4.5), tree plantings are being located in the following locations:

- To add shade to the landscape around the beach area
- To complement the row of trees between the main parking and Lowell Street
- To accent and provide shade in the playground
- To accent the entry and screen the filtration building from the man parking
- To revegetate the areas around the perimeter targeted for invasive species management.

Th vast majority of tree species proposed for planning (plant schedules are located on sheets L4.2A and L4.4) are species native to Massachusetts.

3. The main parking lot's history being used as a snow storage area by the Arlington Department of Public Works.

After the Conservation Commission hearing, Joe Connelly, Arlington Recreation Director, spoke to Michael Rademacher, Arlington DPW Director. Rademacher has committed to not using the new parking lot for snow storage in the future.

End of memo

Kyle Zick Landscape Architecture, Inc.

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MEMO

To: Arlington Conservation Commission
Copy to Lexington Conservation Commission

Date: December 31, 2020

From: Mickey Marcus
RE: Revised Plans and information for Arlington Restoration Master Plan Phase II

File: DEP File: 091-0327
SWCA File: 60780

Dear Commission Members:

At our last hearing, several plan revisions were requested by the Conservation Commission, and these have been provided in this memo, and the attachments. These include a revised stormwater report, revisions to the site plans, and clarifications on construction materials and methods of invasive species control.

1) Information on Lexington's stabilized granite requirements. A memo from KZLA is attached providing information on this path material and representative examples in the area.

2) Recalculate stormwater calculations using NOAA Atlas 14+. A revised stormwater report dated December 2020 is attached. This report has been prepared by Woodard & Curran Engineers and is stamped by Denise Cameron, PE.

3) Review removal/replacement of trees. The KZLA memo addresses this item and the planting plans (Sheets L4.1 and L4.5 have been revised. These plan revisions are attached.

4) Add erosion controls (silt sack) around turf area in parking lot to prevent siltation. The civil site plans have been revised to show compost filter erosion controls socks, and stone rip rap at the outfall pipes. These are shown Plan C1.0 and C2.0. Both revised plans are attached.

5) Propose alternatives to glyphosate. The recommended alternatives approved for use by the DEP include Garlon and Milestone. For the Phragmites and Reed Canary Grass we propose using Clearcast, also approved by MADEP. The Commission also asked for application methods other than spraying. For the woody plants we recommend stem cutting with the immediate wipe or wick application of the herbicide to the cut stems. A dye added to the herbicide mix may be used to show which stems have been treated. For the herbaceous plants, a glove-wipe application may be used (e.g. on swallowwort, reed canary grass). For several species such as the Phragmites, Japanese knotweed, and multiflora rose, the preferred treatment is a spray application.

6) Coordinate with DPW to ensure parking lot is not a snow dump. This item has been addressed in the KZLA memo. The Town DPW has committed not to use the new parking lot for snow storage in the future.

7) Possibly schedule another site visit, weather dependent. The project team will be available to meet with any Commission Members or Staff during the NOI review, prior to construction, or during the construction. A site walk with the Town of Lexington Conservation Commission is scheduled for Saturday January 2, 2021.

8) Revise parking lot O&M Plan to include regenerative air sweeper. The stormwater report O&M plan has been revised and this item is addressed on page 194 of the stormwater report. Regenerative air sweeping is recommended twice each year, or as needed.

9) Revise invasive management to include as much cut-and-dab, not spray, as possible. This is addressed in item number 5. All woody invasive plants will use the cut stem treatment and will not use spray for herbicide application.

10) Update plan set with changes (erosion controls, plan has erosion control matting near flared end, but rip rap might be better). These changes have been made as requested by the Commission and they are included on the attached plan revisions by Woodard & Curran Engineers and item #4.

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

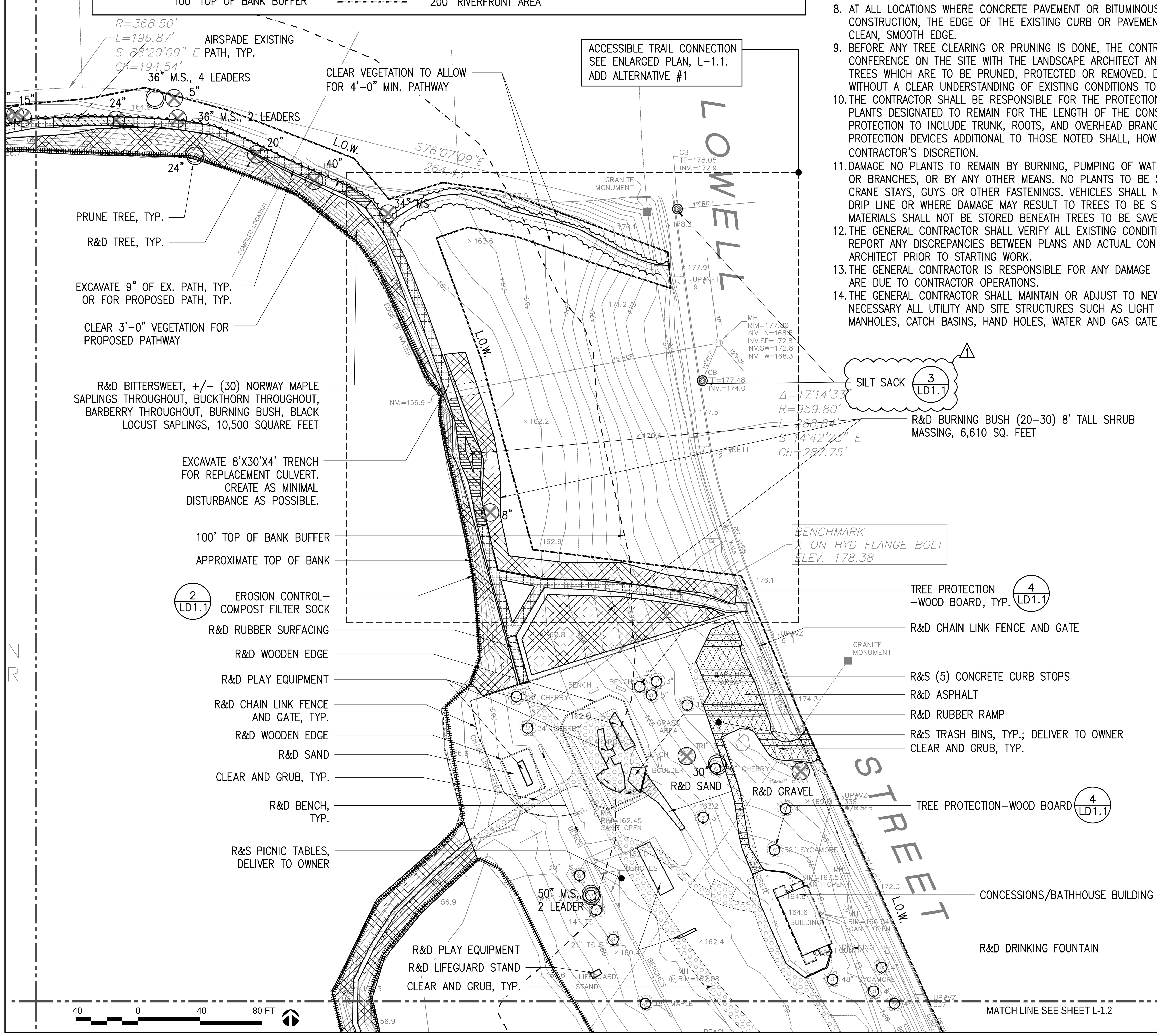
TOWN OF ARLINGTON

MATCH LINE SEE SHEET L-1.5

LEGEND

L.O.W.	LIMIT OF WORK
	CONSTRUCTION FENCE
	TREE PROTECTION -FENCING, TYP. (1 / LD1.1)
	TREE PROTECTION -WOOD BOARD, TYP. (4 / LD1.1)
	EROSION CONTROL -COMPOST SOCK, TYP. (2 / LD1.1)
	SAWCUT LINE, TYP.
	SILT SACK INLET PROTECTION (3 / LD1.1)
	LIGHT POST TO REMAIN AND BE PROTECTED, TYP.
	INVASIVE MANAGEMENT AREA
	GRANITE MILE MARKER
	APPROXIMATE TOP OF BANK
	100' TOP OF BANK BUFFER
24"	REMOVE TREE OR SHRUB, TYP. (SIZE, DBH)
24"	REMOVE INVASIVE TREE OR SHRUB (SIZE, DBH)
24"	PRUNE TREE, (SIZE, DBH)
R&D	REMOVE AND DISPOSE
R&S	REMOVE AND STOCKPILE
R&R	REMOVE AND RESET
	200' RIVERFRONT AREA
	REMOVE AND DISPOSE 10" OF STONE DUST AND GRAVEL BASE
	REMOVE AND DISPOSE ASPHALT, TYP.
	REMOVE AND DISPOSE GRAVEL, TYP.
	STRIP AND STOCKPILE LOAM, TYP.
	CLEAR AND GRUB, TYP.
	AIRSPADE EXISTING PATH, TYP.
	EXCAVATE 9" OF EX. PATH, TYP. OR FOR PROPOSED PATH, TYP.
	SCARIFY STONEDUST PATH, TYP.
	REMOVE AND DISPOSE CONCRETE PAVEMENT, TYP.

NOTE:
1. PROTECT STOCKPILED MATERIALS DURING CONSTRUCTION
2. ALL GRANITE BENCHES TO BE R&S FOR REUSE ON SITE; ALL GRANITE MILE MAKERS TO BE R&R
3. ALL WOOD SIGN POSTS, UNLESS OTHERWISE DESIGNATED, TO BE R&R



MATCH LINE SEE SHEET L-1.2

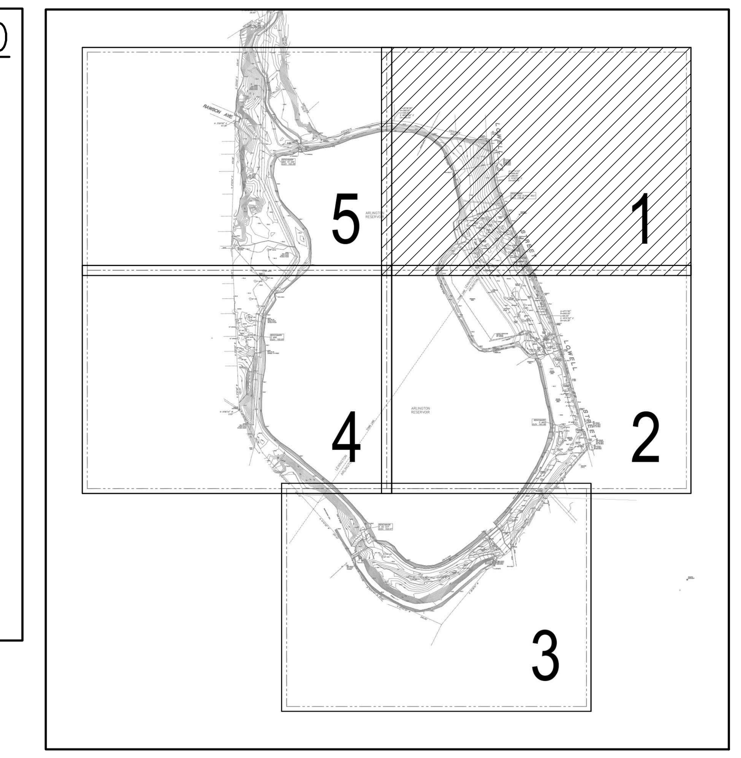
SITE PREPARATION AND DEMOLITION NOTES:

1. PRIOR TO COMMENCING ANY EXCAVATION WORK, THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES IN ACCORDANCE WITH THE "DIG SAFE" NOTIFICATION PROCEDURES PROMOTED BY RESPECTIVE UTILITY COMPANIES. THE DIG SAFE TELEPHONE NUMBER FOR MASSACHUSETTS IS 811.
2. PRIOR TO COMMENCING EARTHWORK, EROSION & SEDIMENTATION CONTROLS MUST BE IN PLACE, INCLUDING BUT NOT LIMITED TO COMPOST SOCKS AND SILT SACKS.
3. THE LOCATIONS OF ALL UNDERGROUND UTILITIES SHOWN ON THIS PLAN ARE DIAGRAMMATIC ONLY. THE CONTRACTOR SHALL CONTACT THE PROPER LOCAL AUTHORITIES OR RESPECTIVE UTILITY COMPANY TO CONFIRM THE LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. ANY DAMAGE DUE TO FAILURE OF THE CONTRACTOR TO CONTACT THE PROPER AUTHORITIES SHALL BE BORNE BY THE CONTRACTOR.
4. ALL REFUSE, DEBRIS, AND MISCELLANEOUS ITEMS TO BE REMOVED, THAT ARE NOT TO BE STOCKPILED FOR LATER USE ON THE PROJECT OR DELIVERED TO THE OWNER, SHALL BE LEGALLY DISPOSED OF OFF-SITE BY THE CONTRACTOR.
5. ALL ITEMS REQUIRING REMOVAL SHALL BE REMOVED TO FULL DEPTH TO INCLUDE BASE MATERIAL AND FOOTINGS OR FOUNDATIONS AS APPLICABLE, AND REUSED AS DIRECTED BY THE OWNER OR LEGALLY DISPOSED OF OFF-SITE BY CONTRACTOR.
6. CONTRACTOR SHALL STRIP AND STOCKPILE EXISTING TOPSOIL TO FULL DEPTH WITHIN LIMIT OF GRADING BEFORE COMMENCING EXCAVATION AND GRADING OPERATIONS. TOPSOIL SHALL NOT BE REMOVED FROM THE SITE, UNLESS APPROVED BY THE LANDSCAPE ARCHITECT.
7. ALL MATERIALS THAT ARE TO BE STORED & STOCKPILED ON SITE THAT ARE LOOSE AND MAY WASH WITH RAIN EVENTS, ARE TO BE COVERED WITH A TARP AND/OR SURROUNDED WITH EROSION &SEDIMENT CONTROLS.
8. AT ALL LOCATIONS WHERE CONCRETE PAVEMENT OR BITUMINOUS CONCRETE ABUT NEW CONSTRUCTION, THE EDGE OF THE EXISTING CURB OR PAVEMENT SHALL BE SAWCUT TO A CLEAN, SMOOTH EDGE.
9. BEFORE ANY TREE CLEARING OR PRUNING IS DONE, THE CONTRACTOR SHALL ARRANGE A CONFERENCE ON THE SITE WITH THE LANDSCAPE ARCHITECT AND TREE WARDEN TO IDENTIFY TREES WHICH ARE TO BE PRUNED, PROTECTED OR REMOVED. DO NO CLEARING OR PRUNING WITHOUT A CLEAR UNDERSTANDING OF EXISTING CONDITIONS TO BE PRESERVED.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING TREES AND PLANTS DESIGNATED TO REMAIN FOR THE LENGTH OF THE CONSTRUCTION PERIOD. PROTECTION TO INCLUDE TRUNK, ROOTS, AND OVERHEAD BRANCHES. THE PLACEMENT OF PROTECTION DEVICES ADDITIONAL TO THOSE NOTED SHALL, HOWEVER, BE AT THE CONTRACTOR'S DISCRETION.
11. DAMAGE NO PLANTS TO REMAIN BY BURNING, PUMPING OF WATER, CUTTING OF LIVE ROOTS OR BRANCHES, OR BY ANY OTHER MEANS. NO PLANTS TO BE SAVED SHALL BE USED FOR CRANE STAYS, GUYS OR OTHER FASTENINGS. VEHICLES SHALL NOT BE PARKED WITHIN THE DRIP LINE OR WHERE DAMAGE MAY RESULT TO TREES TO BE SAVED. CONSTRUCTION MATERIALS SHALL NOT BE STORED BENEATH TREES TO BE SAVED.
12. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD AND REPORT ANY DISCREPANCIES BETWEEN PLANS AND ACTUAL CONDITIONS TO THE LANDSCAPE ARCHITECT PRIOR TO STARTING WORK.
13. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING CONDITIONS THAT ARE DUE TO CONTRACTOR OPERATIONS.
14. THE GENERAL CONTRACTOR SHALL MAINTAIN OR ADJUST TO NEW FINISH GRADE AS NECESSARY ALL UTILITY AND SITE STRUCTURES SUCH AS LIGHT POLES, SIGN POLES, MANHOLES, CATCH BASINS, HAND HOLES, WATER AND GAS GATES, HYDRANTS, ETC., FROM MAINTAINED UTILITY AND SITE SYSTEMS UNLESS OTHERWISE NOTED ON THE UTILITY DRAWINGS OR AS DIRECTED BY THE LANDSCAPE ARCHITECT.
15. THE CONTRACTOR SHALL COORDINATE ALL ADJUSTMENT OR ABANDONMENT OF UTILITIES WITH THE RESPECTIVE UTILITY COMPANY.
16. ALL POINTS OF CONSTRUCTION INGRESS AND EGRESS SHALL BE PROTECTED TO PREVENT TRACKING OF MUD ONTO PUBLIC WAYS. ANY MUD ON PUBLIC WAYS ORIGINATING FROM THE JOB SITE SHALL BE CLEANED BY THE CONTRACTOR.
17. CONTRACTOR SHALL SECURE ALL PERMITS THAT MAY BE REQUIRED FROM ALL JURISDICTIONS AFFECTED BY THIS WORK.
18. CONTRACTOR'S EQUIPMENT AND VEHICLES SHALL BE PARKED ON PAVED SURFACES ONLY. NO PARKING ON TURF OR SAND AREAS.
19. CONTRACTOR CAN REQUEST TO UTILIZE ADDITIONAL STAGING AREAS WITHIN THE LIMIT OF WORK. ALL STAGING AREAS, AS SHOWN ON THE PLANS OR ADDITIONAL AREAS REQUESTED BY THE CONTRACTOR, SHALL PROVIDE PROTECTION OF THE GROUND PER THE SPECIFICATIONS. NO ADDITIONAL COST CAN BE REQUESTED FOR ADDITIONAL STAGING AREAS.
20. WITHIN THE LIMIT OF WORK, CONTRACTOR SHALL IDENTIFY ALL TREE LIMBS LOWER THAN 10' ABOVE THE GROUND SURFACE THAT MAY BE VULNERABLE TO EQUIPMENT DAMAGE. NOTIFY THE LANDSCAPE ARCHITECT PRIOR TO STARTING WORK BENEATH ANY OF THESE LIMBS. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO TREE LIMBS THAT ARE DUE TO CONTRACTOR OPERATIONS.
21. CONTRACTOR TO CLEAN ALL DRAINAGE STRUCTURES WITHIN LIMIT OF WORK BEFORE SITE WORK BEGINS, AND AT THE END OF THE PROJECT. CONTRACTOR TO PROVIDE SILT SACKS FOR ALL CATCH BASINS WITH LIMIT OF WORK. CONTRACTOR TO CLEAN ALL DRAINAGE PIPES CONNECTED TO ALL CATCH BASINS THAT ARE WITHIN THE LIMIT OF WORK.

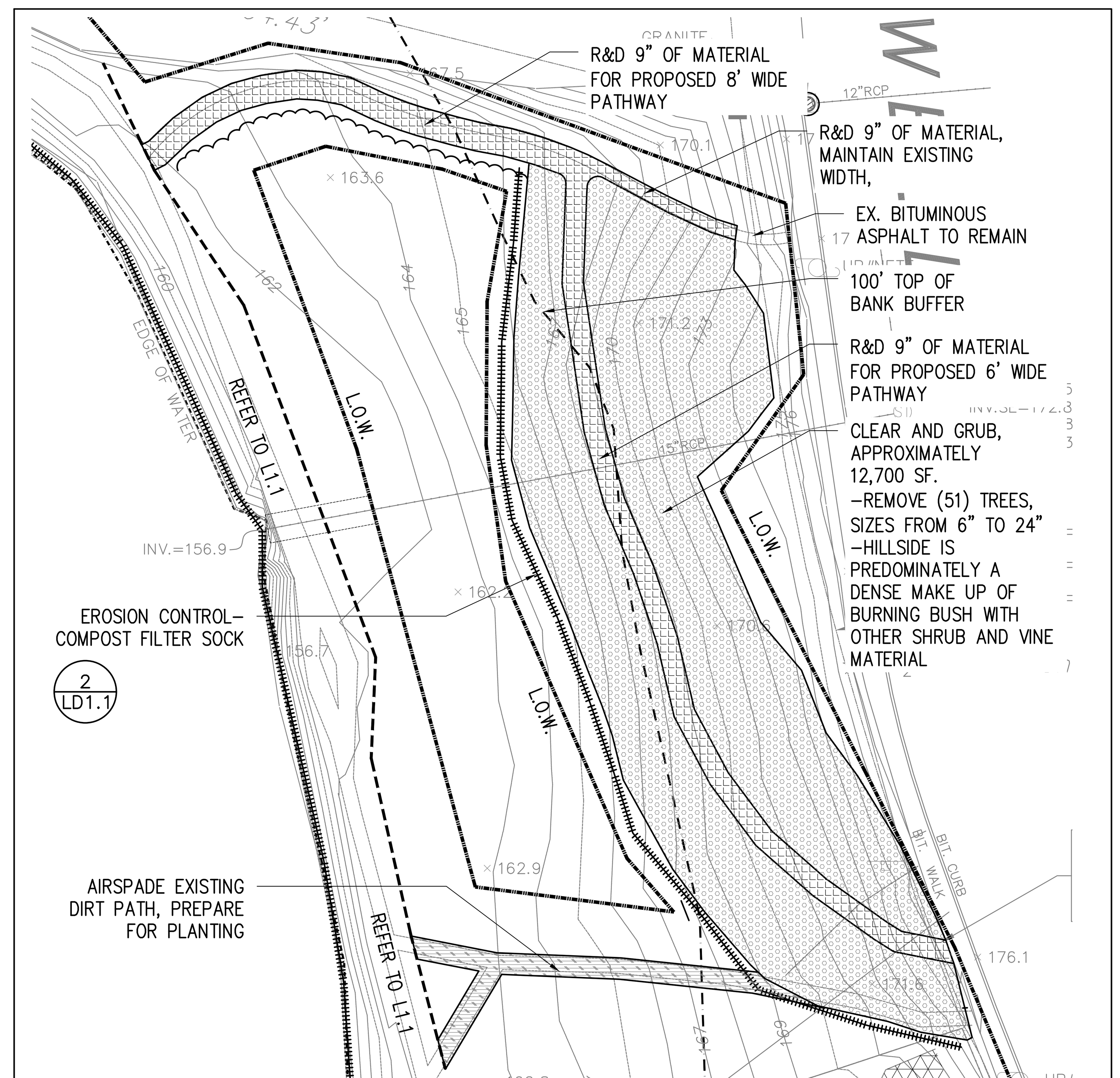
ARLINGTON TREE REMOVAL AND REPLACEMENT POLICY:

1. REMOVAL OF A 3-8" DBH TREE SHALL BE REPLACED WITH (1) TREE
2. REMOVAL OF A 9-20" DBH TREE SHALL BE REPLACED WITH (2) TREES
3. REMOVAL OF A 21"+ DBH TREE SHALL BE REPLACED WITH (3) TREES
4. TOTAL PROPOSED TREES TO REMOVE:

3-8"	=	11 TREES
9-20"	=	9 TREES
21"+	=	5 TREES
TOTAL	=	44 TREES



KEY PLAN



1 ACCESSIBLE TRAIL CONNECTION - ADD ALT.
SCALE: 1"=30'-0"

NO.	REVISION	DATE
1	EROSION CONTROL	12.30.20

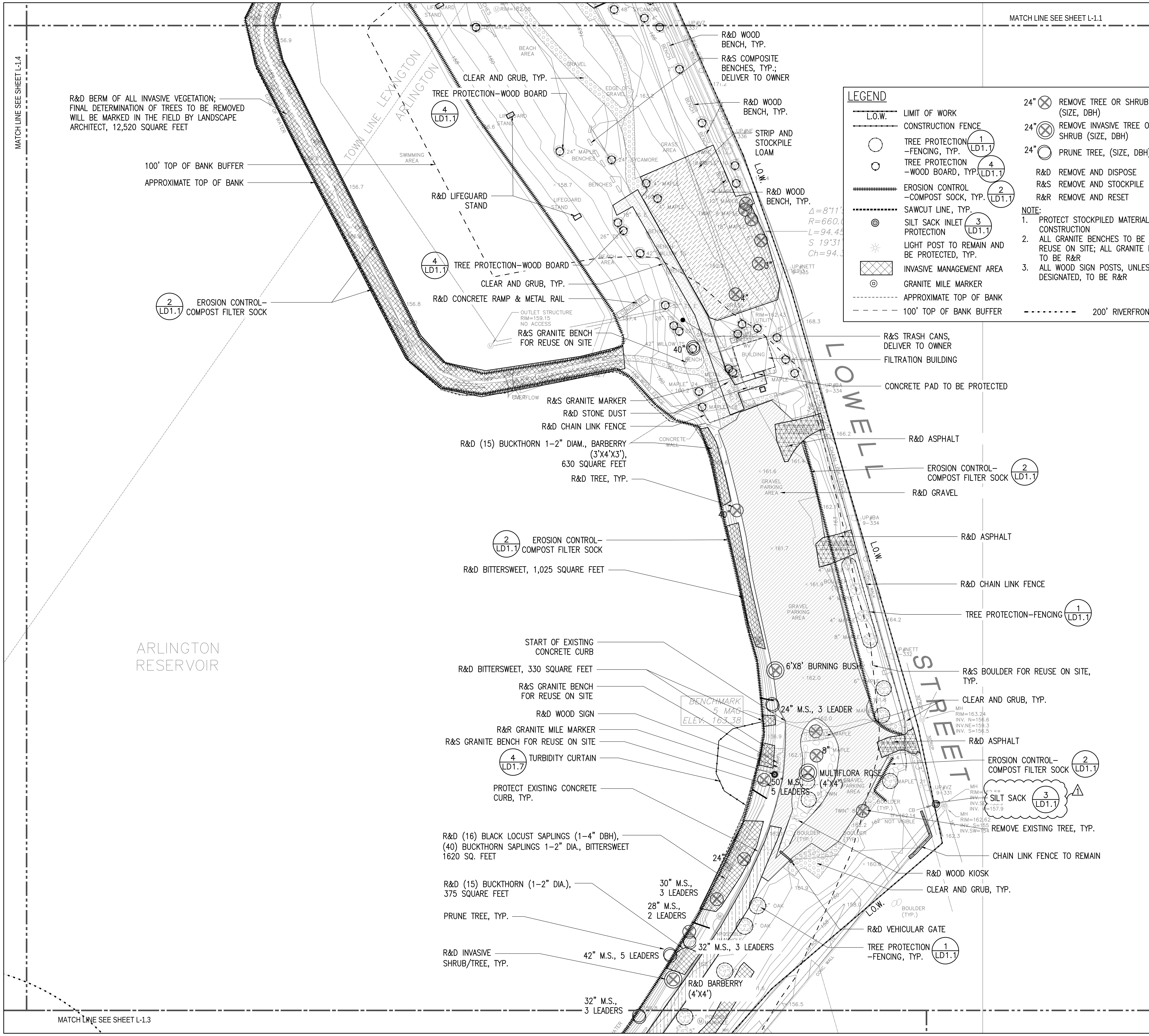
kzla
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202
Boston, MA 02108
617 451-1018 Tel
www.kylezick.com

90% CONSTRUCTION DOCUMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB Checked By: KZ
Date: DECEMBER 19, 2020
Scale: 1"=40'-0"
Drawing Title:

SITE PREPARATION AND DEMO PLAN

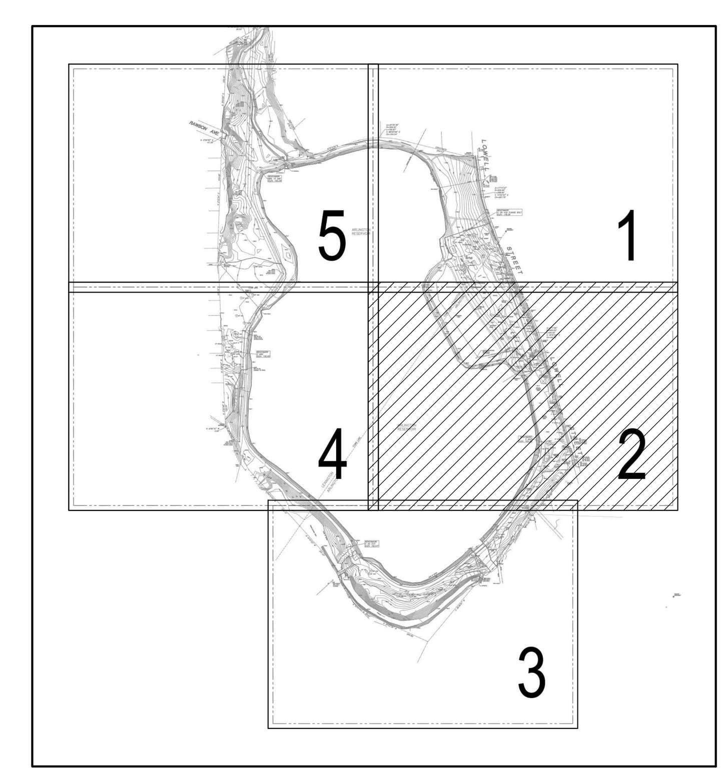
L1.1



LEGEND

- L.O.W. — LIMIT OF WORK
- CONSTRUCTION FENCE
- TREE PROTECTION-FENCING, TYP. (1 LD1.1)
- TREE PROTECTION-WOOD BOARD, TYP. (4 LD1.1)
- EROSION CONTROL-COMPOST SOCK, TYP. (2 LD1.1)
- SAWCUT LINE, TYP.
- SILT SACK INLET PROTECTION (3 LD1.1)
- LIGHT POST TO REMAIN AND BE PROTECTED, TYP.
- INVASIVE MANAGEMENT AREA
- GRANITE MILE MARKER
- APPROXIMATE TOP OF BANK
- 100' TOP OF BANK BUFFER
- 200' RIVERFRONT AREA
- 24" REMOVE TREE OR SHRUB, TYP. (SIZE, DBH)
- 24" REMOVE INVASIVE TREE OR SHRUB (SIZE, DBH)
- 24" PRUNE TREE, (SIZE, DBH)
- R&D REMOVE AND DISPOSE
- R&S REMOVE AND STOCKPILE
- R&R REMOVE AND RESET
- REMOVE AND DISPOSE 10" OF STONE DUST AND GRAVEL BASE
- REMOVE AND DISPOSE ASPHALT, TYP.
- REMOVE AND DISPOSE GRAVEL, TYP.
- STRIP AND STOCKPILE LOAM, TYP.
- CLEAR AND GRUB, TYP.
- AIRSPADE EXISTING PATH, TYP.
- EXCAVATE 9" OF EX. PATH, TYP.
- SCARIFY STONEDUST PATH, TYP.
- REMOVE AND DISPOSE CONCRETE PAVEMENT, TYP.

NOTE:
1. PROTECT STOCKPILED MATERIALS DURING CONSTRUCTION
2. ALL GRANITE BENCHES TO BE R&S FOR REUSE ON SITE; ALL GRANITE MILE MAKERS TO BE R&R
3. ALL WOOD SIGN POSTS, UNLESS OTHERWISE DESIGNATED, TO BE R&R



KEY PLAN

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE
1	EROSION CONTROL	12.30.20

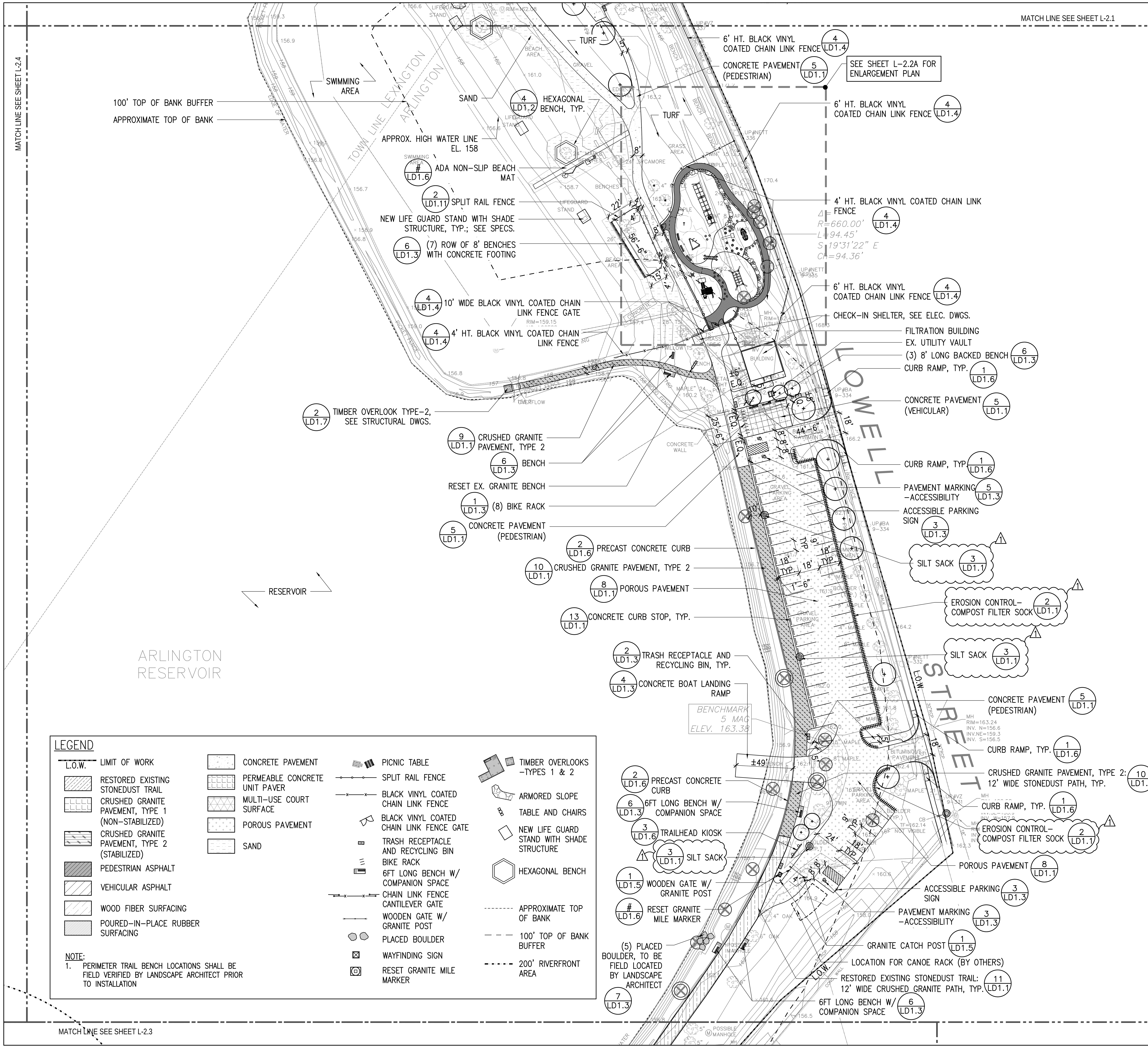
kzla
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202
Boston, MA 02108
617 451-1018 Tel
www.kylezick.com

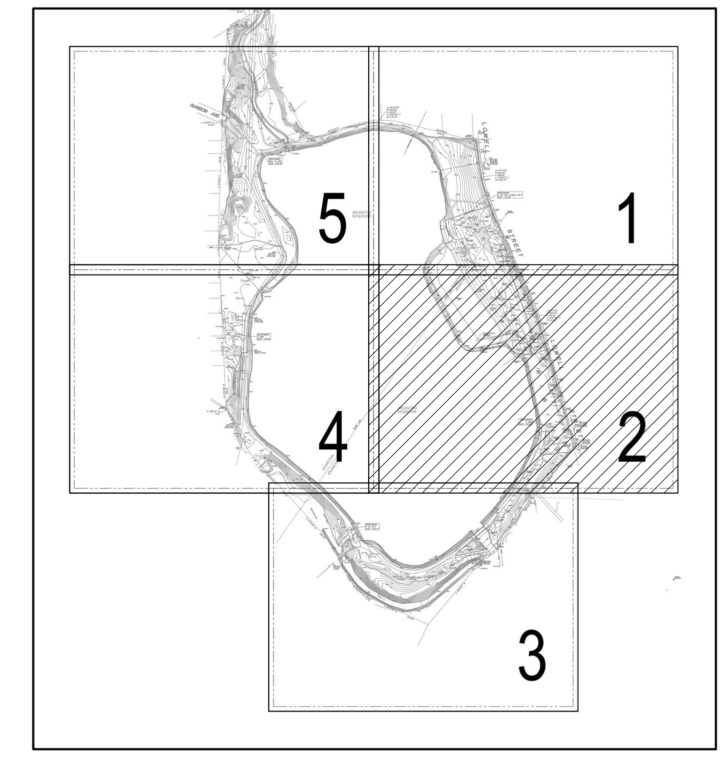
90% CONSTRUCTION DOCUMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB
Checked By: KZ
Date: DECEMBER 19, 2020
Scale: 1"=40'-0"
Drawing Title:

SITE PREPARATION AND DEMO PLAN

L1.2





KEY PLAN

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE
1	EROSION CONTROL	12.30.20

kzla
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90% CONSTRUCTION DOCUMENT SET

Job Number:
Project: ARLINGTON RES.
Drawn By: JL/MD/RB
Checked By: KZ
Date: DECEMBER 19, 2020
Scale: 1"=40'-0"
Drawing Title:

LAYOUT AND MATERIAL PLAN

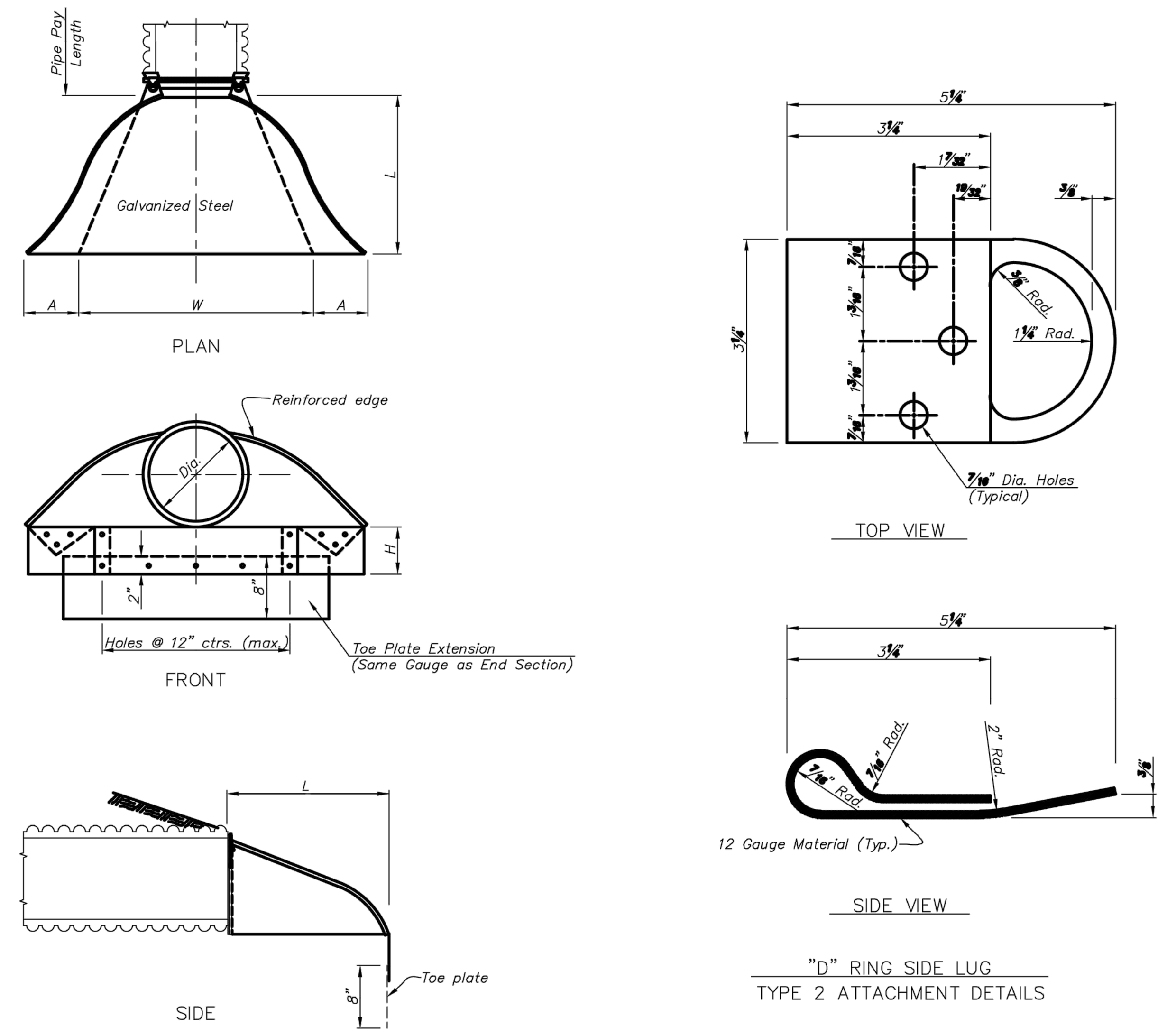
L2.2

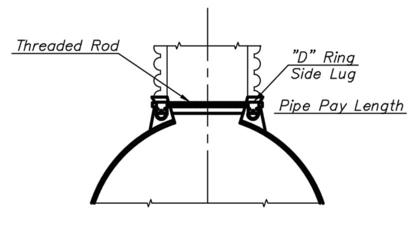
END SECTIONS FOR HDPE PIPE								
Dia.	Gauge	Weight	* A	* H	* L	* W	Slope	Overall Width
6"	18	10	4	3	8	12	2	20"
8"	18	14	5 3/4	4	14 1/2	16	2 1/4	27 1/2"
10"	18	17	7 5/8	6	14 1/2	20	2 1/2	35 1/4"
12"	16	25	7	6	21	24	2 1/2	38"
15"	16	33	8	6	26	30	2 1/2	46"
18"	16	42	8	6	31	36	2 1/2	52"
21"	16	49	9	6	36	42	2 1/2	60"
24"	16	65	10	6	41	48	2 1/2	68"
30"	14	123	12	8	51	60	2 1/2	84"
36"	14	135	14	9	60	72	2 1/2	100"
42"	12	320	16	11	69	84	2 1/2	116"
48"	12	375	18	12	78	90	2 1/4	126"
54"	12	440	18	12	84	102	2 1/4	138"
60"	12/10	610	18	12	87	114	2	150"

Toe plate extensions where specified, to be punched to match holes in apron lip. 3/8" bolts to be furnished. The length of toe plate to be as follows: W + 10" for 12" to 30" diameter pipes inclusive.
W + 20" for 36" to 60" diameter pipes inclusive.

Multiple panel end sections shall have lap seams which are to be tightly jointed by bolts. Corner plate, and toe plate to be same gauge as end section.

** – Dimensions in Inches Plus or Minus Standard Shop Tolerance.*

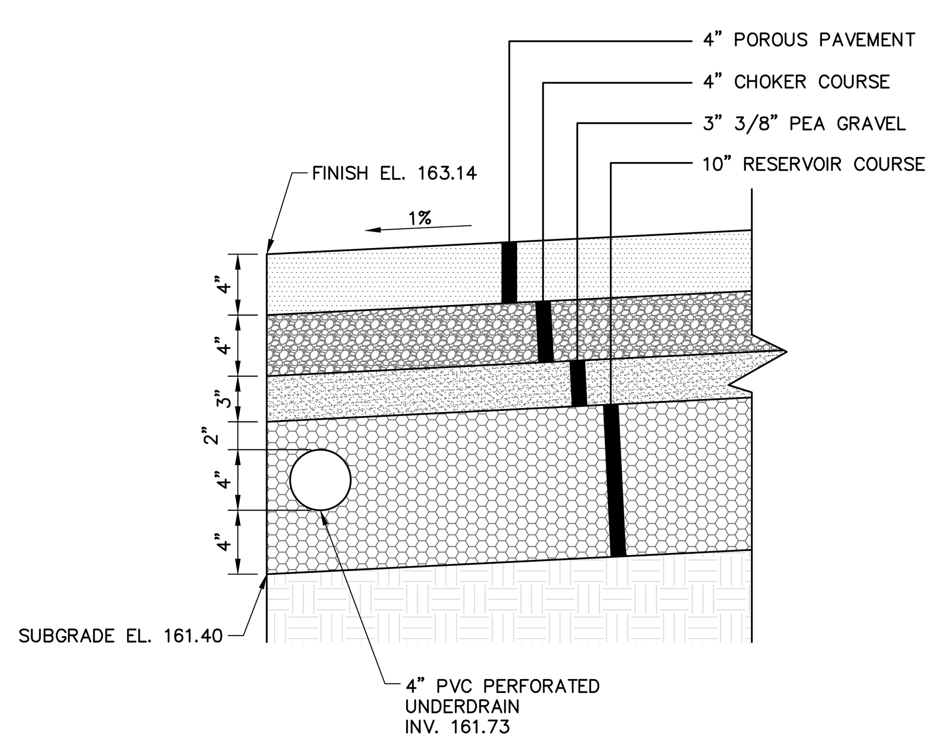




TYPE 2 CONNECTIONS
(12" & Larger)

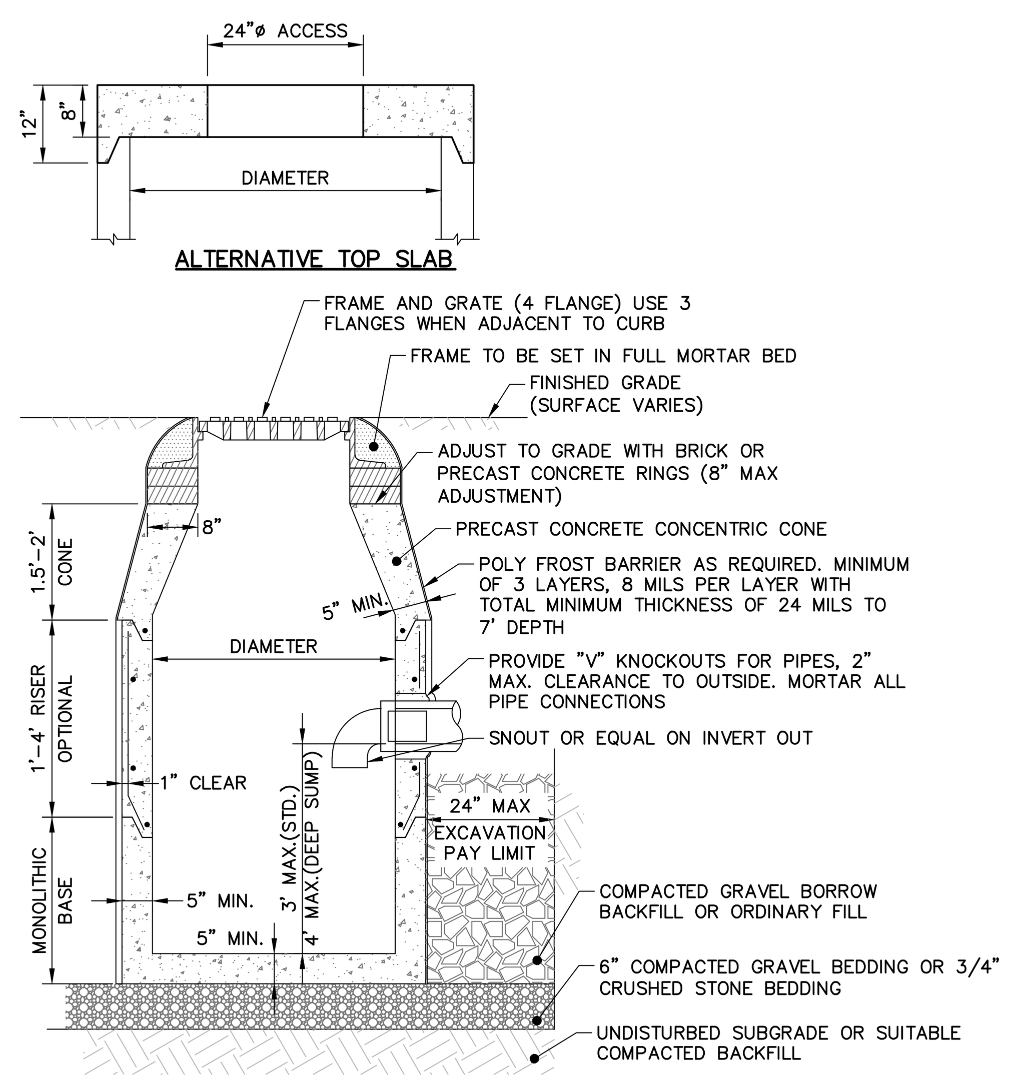
FLARED PIPE END DETAIL

N.T.S.



POROUS PAVEMENT SECTION

N.T.S.

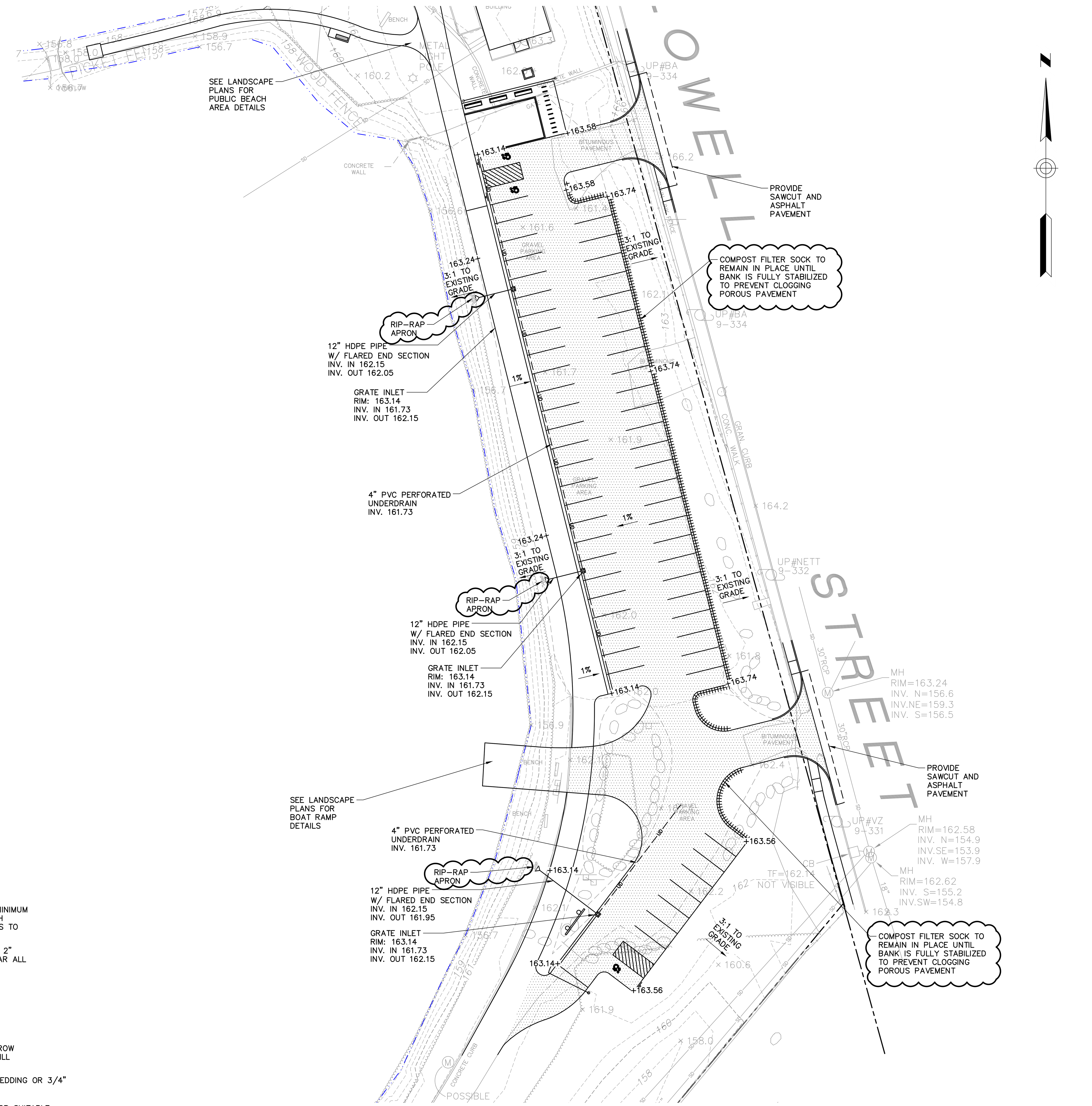


NOTES:

1. PRECAST CONCRETE STRUCTURES AND CASTINGS SHALL BE SUITABLE FOR HS-20 LOADINGS.
2. PRECAST CONCRETE STRUCTURES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C-478.
3. ALTERNATE TOP SLAB MAY BE USED AS DICTATED BY DESIGN AND/OR FIELD CONDITIONS.
4. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE BUTYL RUBBER.
5. CATCH BASIN FRAME AND GRATE(S) SHALL MEET MUNICIPAL AND STATE SPECIFICATIONS WHEN APPLICABLE.

PRECAST CONCRETE CATCH BASIN

NOT TO SCALE



30' 0 30' 60'
BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

NOT FOR CONSTRUCTION

24x36 SHEET
1:1

WOODARD & CURRAN
40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

COMMONWEALTH OF MASSACHUSETTS
DENISE L. CAMERON
CIVIL
No. 53548
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
1	ARLINGTON CONSERVATION COMMISSION COMMENTS	12/30/2020

DESIGNED BY: LT
CHECKED BY: BM
DRAWN BY: BCM
0233115.00 – C-1.dwg

DRAINAGE PLAN

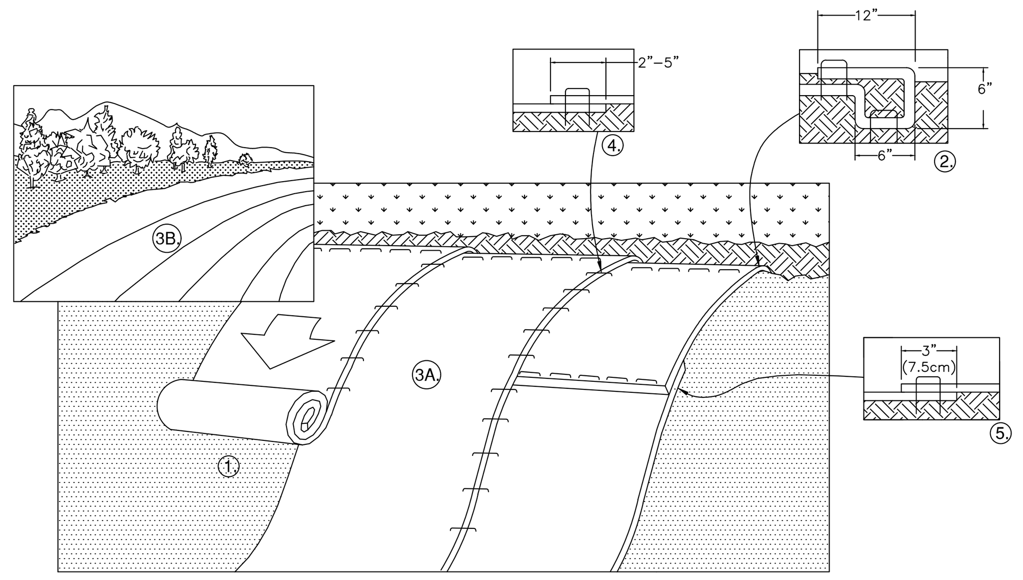
TOWN OF ARLINGTON
ARLINGTON, MASSACHUSETTS

ARLINGTON RESERVOIR PHASE 2

JOB NO.: 0233115.00
DATE: NOVEMBER 2020
SCALE: 1"=30'
SHEET: 1 OF 2

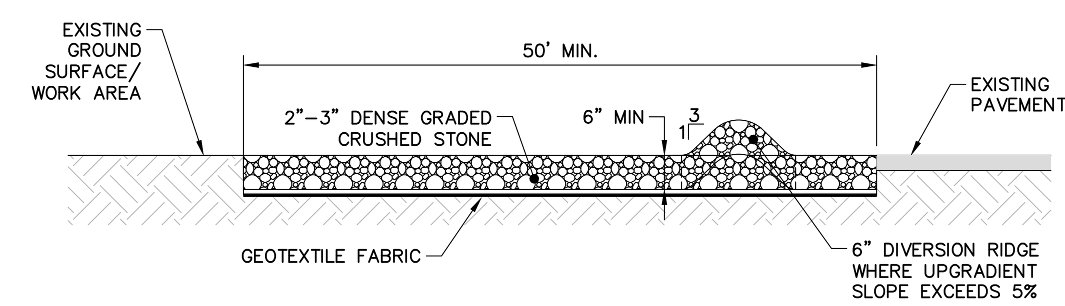
C1.0

\\woodardcurran.net\shared\Projects\0233115.00 KZLA Architects – Arlington Reservoir Phase 2\wip\Drawings\Civil\0233115.00 – C-1.dwg, Dec 30, 2020 – 4:54pm BMUSTAIN

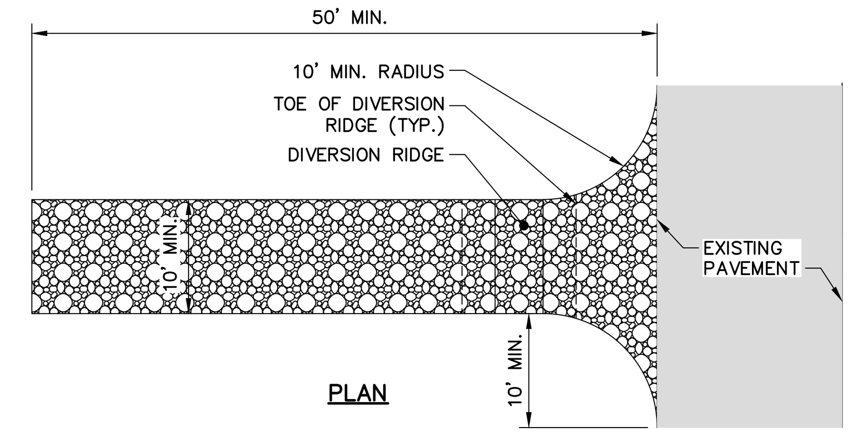


1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED AS WELL AS REMOVING ANY PROTRUDING ROCKS, STUMPS OR ROOTS. DURING THE GROWING SEASON (APRIL 15–SEPTEMBER 15) USE RECP'S ON THE BASE OF GRASSED WATERWAYS, SOIL SLOPES HAVING A GRADE GREATER THAT 15%, OR ANYWHERE WHERE HAY MULCH HAS PROVEN TO BE INEFFECTIVE AT CONTROLLING SHEET EROSION. RECP'S ARE A MANUFACTURED COMBINATION OF MULCH AND NETTING DESIGNED TO PREVENT EROSION AND RETAIN SOIL MOISTURE. FOR OVER WINTER PROTECTION, APPLY RECP'S ON THE BASE AND SIDE SLOPES OF GRASSED WATERWAYS AND ON SLOPES STEEPER THAN AN 8% GRADE.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE RECP's IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP's EXTENDED BEYOND THE UP–SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE RECP's.
3. ROLL THE RECP's (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. THE EDGES OF PARALLEL RECP's MUST BE STAPLED WITH APPROXIMATELY 2" – 5" OVERLAP DEPENDING ON RECP's TYPE.
5. CONSECUTIVE RECP's SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE RECP's WIDTH. NOTE: *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE RECP's.
6. UNTIL GRASS IS ABUNDANT, INSPECT PERIODICALLY AND AFTER EACH RAINSTORM TO CHECK FOR EROSION. IMMEDIATELY REPAIR AND ADD MORE MULCH UNTIL GRASSES ARE FIRMLY ESTABLISHED. DO NOT MOW THE FIRST YEAR.

ROLLED EROSION CONTROL MATTING
N.T.S.



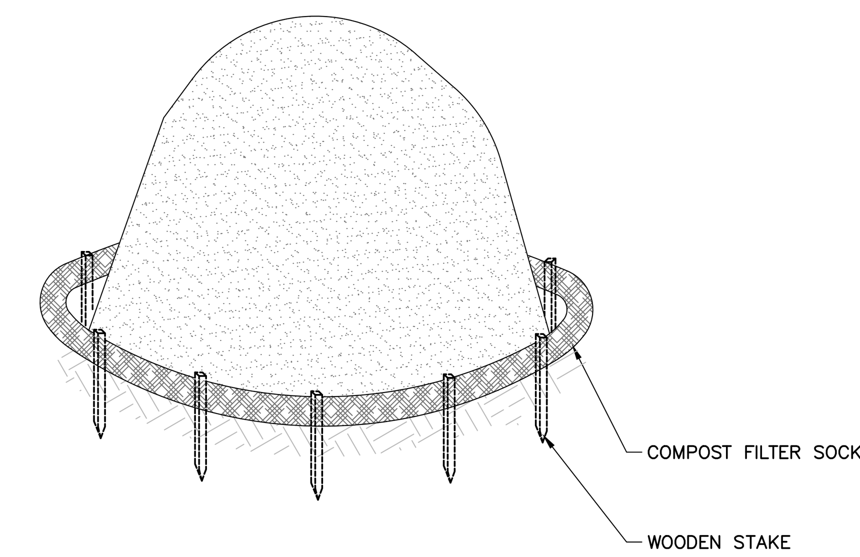
SECTION



PLAN

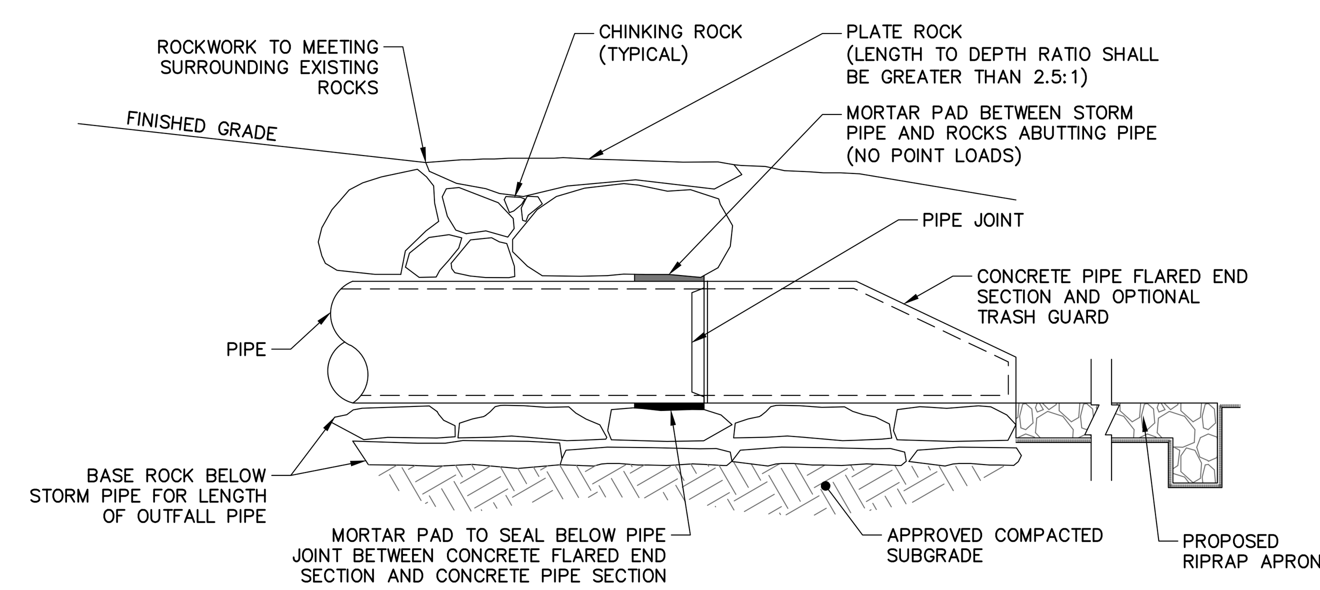
NOTES:
1. GRADE TOWARDS SEDIMENT BARRIER WHEN NECESSARY TO MANAGE FLOW.
2. INCREASE MINIMUM LENGTH TO 100' WHERE TRACKED SEDIMENTS CONTAIN LESS THAN 80% SAND OR AS NECESSARY FOR HEAVY CONSTRUCTION.

STABILIZED CONSTRUCTION ENTRANCE/EXIT
N.T.S.



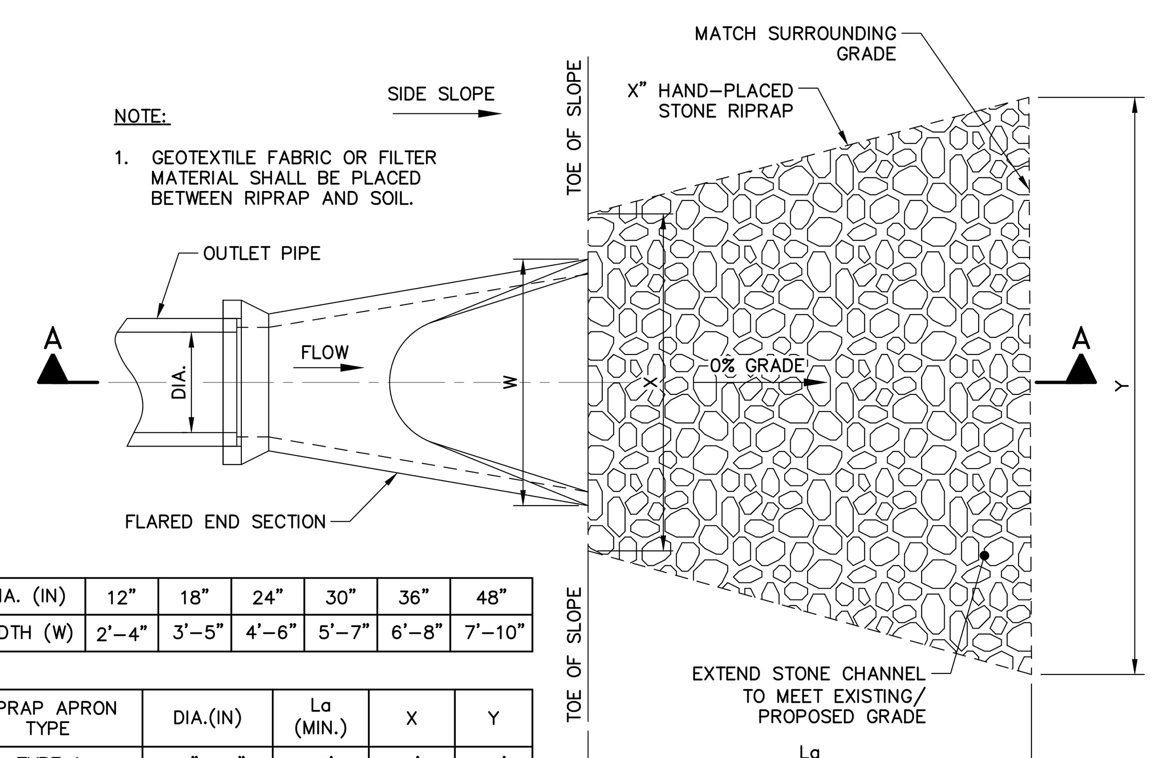
NOTES:
1. STOCKPILES SHALL BE SURROUNDED BY COMPOST FILTER SOCKS.
2. STOCKPILES SHALL HAVE A MAXIMUM 2:1 (H:V) SIDE SLOPE.
3. REPAIR OR REPLACE DAMAGED COMPOST FILTER SOCKS DUE TO CONSTRUCTION ACTIVITIES OR STOCKPILE MITIGATION.

TEMPORARY SOIL STOCKPILE
N.T.S.



SECTION A–A

NOTE:
1. GEOTEXTILE FABRIC OR FILTER MATERIAL SHALL BE PLACED BETWEEN RIPRAP AND SOIL.



DIA. (IN)	12"	18"	24"	30"	36"	48"
WIDTH (W)	2'–4'	3'–5'	4'–6'	5'–7'	6'–8'	7'–10'

RIPRAP APRON TYPE	DIA.(IN)	La (MIN.)	X	Y
TYPE 1	12"–24"	10'	6'	16'
TYPE 2	24"–48"	12'	9'	19'

PLAN

RIPRAP APRON OUTLET PROTECTION AT FLARED END
NOT TO SCALE

30' 0 30' 60'
BAR SCALE
1" = 30'
CHECK GRAPHIC SCALE BEFORE USING

NOT FOR CONSTRUCTION

WOODARD & CURRAN
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COMMITMENT & INTEGRITY DRIVE RESULTS

COMMONWEALTH OF MASSACHUSETTS
DENISE L. CAMERON
CIVIL
No. 53548
REGISTERED PROFESSIONAL ENGINEER

REV	DESCRIPTION	DATE
1	ARLINGTON CONSERVATION COMMISSION COMMENTS	12/30/2020

DESIGNED BY: LT
DRAWN BY: BCM
CHECKED BY: BM
0233115.00 – C-1.dwg

EROSION & SEDIMENT CONTROL DETAILS

TOWN OF ARLINGTON
ARLINGTON, MASSACHUSETTS

ARLINGTON RESERVOIR
PHASE 2

JOB NO.: 0233115.00
DATE: NOVEMBER 2020
SCALE: 1"=30'
SHEET: 2 OF 2

C2.0

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STORMWATER MANAGEMENT REPORT

Arlington Reservoir – Phase 2

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0233115.00
Town of Arlington
Massachusetts
October 2020

Revised December 2020

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APPENDICES

1. PROJECT DESCRIPTION

1.1 Introduction

On behalf of the Town of Arlington, Massachusetts (the Town), Woodard & Curran, Inc. (Woodard & Curran) has prepared this Stormwater Management Report for the proposed improvements to the Arlington Reservoir, located at 210 Lowell Street in Arlington, Massachusetts (the Site). The Town is proposing to revitalize the eastern shore of the Arlington Reservoir recreation area. Weston & Sampson Engineers, Inc. (Weston and Sampson), on behalf of the Town of Arlington, developed a Master Plan for the Reservoir in 2018. This proposed project encompasses Phase 2 of the Master Plan and improvements include installing porous pavement over the approximately 0.5-acre gravel parking area in the southern portion of the site, installation of new ADA-accessible pathways, a new play area, a multi-use court, a boat launch, and several other Site improvements as shown on the Post-Development Watershed Figure located in **Appendix C**. The impacts of these improvements to the Site's stormwater drainage patterns are summarized in this report.

1.2 Existing Conditions

A Site Locus Plan on a United States Geological Survey (USGS) Quadrangle Map depicting the project location has been provided in **Appendix A**. Arlington Reservoir is a 65-acre man-made recreational and stormwater-control pond on the Arlington and Lexington Town border. About half of the reservoir's open water is located in the Town of Lexington, however, the Town of Arlington owns and manages the reservoir. The earthen dam around the southern edge of the Reservoir is approximately 600 yards long and up to 14 feet tall. The water within the Reservoir discharges into Mill Brook through a sluice gate.

In 1935, the Town of Arlington constructed a sandy beach on the Reservoir's eastern shore. In the late 1970s, the Town completed improvements to the beach and added an embankment to separate the swimming area from the rest of the Reservoir. The beach now includes a filtered, chlorinated swimming area with a ramp for ADA accessibility, a bathhouse, vending machines, a concession area, and a playground. The Reservoir also has a one-mile walking trail around its perimeter, open to the public throughout the year.

1.2.1 Land Cover and Soils

Land cover and soils datasets were used to develop hydrologic curve numbers. Land cover was determined by a site visit conducted on September 3, 2020 and review of aerial photography and site survey data. A more detailed examination of the existing land cover within individual drainage subcatchments can be found in section 2.2.2. All existing impervious areas located within the Town of Lexington that are proposed to be replaced with a pervious land cover are required to be considered open space in good condition for stormwater calculations purposes per Lexington's Stormwater Management Regulations.

Soil characteristics were observed during test pit evaluations conducted in August 2020 and supplemented with information obtained from the United States Department of Agriculture's (USDA's) most recent Web Soil Survey. A Site map showing soil types and hydrologic soil group classifications within the project vicinity from the USDA's Web Soil Survey is located in **Appendix B**.

Test pits were conducted by Civil Design Consultants, Inc. (CDCI) of Methuen, Massachusetts on August 6, 2020 to evaluate the subsurface soil conditions and identify the estimated seasonal high groundwater table elevation. In all four borings conducted, CDCI observed a surface layer of fill ranging from 9 to 27 inches in depth, followed by a sandy loam layer extending to the bottom of each test pit. From these test pits, it was determined that at its highest elevation in the 0.5-acre parking lot, the seasonal high groundwater table is located approximately at elevation 159.40. Woodard & Curran used this data to locate the proposed stormwater best management practices (BMPs) at elevations with at

least two feet of separation from groundwater. Bedrock was not encountered during test pitting activities. The test pit logs and location figure provided by CDCI are located in **Appendix B**.

1.2.2 Topography

Subcatchment boundaries were delineated using the site survey performed and prepared by Weston & Sampson in December 2017. Topographically, the eastern shore of the Reservoir generally slopes downward from Lowell Street towards the Reservoir, with the exception of the southern-most portion of the 0.5-acre gravel parking area, which slopes downwards towards a ditch just north of the property located at 202 Lowell Street.

In both the pre- and post-development Site conditions, stormwater travels across the Site via overland flow and discharges into one of three Design Points: Arlington Reservoir, the on-Site swimming area, and the ditch located north of 202 Lowell Street. The Design Points and contributing areas are further described in Section 2.2.1. and are depicted in the Pre- and Post-Development Watershed Figures in **Appendix C**.

1.2.3 Resource and Critical Areas

Woodard & Curran reviewed Massachusetts Geographic Information System (MassGIS) data, the Massachusetts Department of Environmental Protection's (MassDEP's) Habitat of Potential Regional and Statewide Importance maps, the Massachusetts Stormwater Handbook, the Massachusetts Year 2016 Integrated List of Waters, and the Federal Emergency Management Agency's (FEMA's) National Flood Hazard Layer (NFHL) database. The findings of our review are below:

- The Massachusetts Endangered Species Act (MESA) protects rare species and their habitats by prohibiting the taking of any plant or animal species listed as Endangered, Threatened, or Special Concern by the Massachusetts Division of Fisheries & Wildlife. MESA review is required by the Natural Heritage & Endangered Species Program (NHESP) for projects and activities located within a Priority or Estimated Habitat of Rare Species. Review of the MassGIS Data shows there are no Priority or Estimated Habitats within the Project Area; therefore, the project is not subject to MESA review.
- Per MassGIS Data, there are no Certified or Potential Vernal Pools within or near the project area.
- Per MassGIS Data, the project is not located within any Areas of Critical Environmental Concern.
- Per the MassDEP's Habitat of Potential Regional and Statewide Importance maps for the Towns of Arlington and Lexington, the project in not located within a Habitat of Regional or Statewide Importance.
- Per the Massachusetts Stormwater Handbook, critical areas include Outstanding Resource Waters and Special Resource Waters, recharge areas for public water supplies, bathing beaches, cold-water fisheries, and shellfish growing areas. Review of MassGIS Data indicated that the Arlington Reservoir is not located within a resource area, however, the Swimming Area on the eastern shore of the Reservoir is classified as a bathing beach, as defined in 105 CMR 445, and thus a critical area.
- Per the Massachusetts Year 2016 Integrated List of Waters, Mill Brook, which receives discharges from Arlington Reservoir via a sluice gate on the southern portion of the Reservoir, is classified as a Category 5 water, meaning the waterbody requires a Total Maximum Daily Load (TMDL) restriction. Mill Brook's impairment of concern is Escherichia Coli (E. Coli). Proposed site improvements are not likely to increase E. Coli levels in Arlington Reservoir, and thus contributing to Mill Brook's impairment.

- Per FEMA's NFHL database, the majority of the Site is located within an area of minimal flood hazard (Zone X). The Reservoir's shoreline and the isolated swimming area are located within special flood hazard areas (Zone AE). The FEMA NFHL FIRMette Map is located in **Appendix A**.

Measures taken to address the presence of a critical area on-Site are detailed in Section 3.6. Critical areas have specific stormwater analysis guidelines, requiring the use of certain pollution prevention measures and BMPs to the maximum extent practicable for redevelopment projects.

1.3 Proposed Project Work

The proposed project consists of paving the approximately 0.5-acre gravel parking area in the southern portion of the site, renovation of the existing bathhouse and concessions building, installation of new ADA-accessible concrete pathways, lifeguard stands, picnic tables, a playground, multi-use court, boat launch, check-in shelter, and several other surficial Site improvements. Construction activities are expected to begin in March 2021 and end in November 2021.

2. STORMWATER EVALUATION

2.1 Stormwater Modeling Methodology

TR-55/TR-20 methodology was used to develop a hydrologic model of the site. Woodard & Curran used the computer program entitled HydroCAD Version 10.0, developed by HydroCAD Software Solutions, LLC in order to create and analyze the site hydrology. The analysis was conducted in order to establish the peak rates of runoff and estimated runoff volume from the project site. This was accomplished to evaluate pre- and post-development conditions during various storm events. Contributing drainage areas were identified and soils, surface cover, watershed slope, and flow paths were evaluated to develop the necessary HydroCAD model input parameters. A minimum Time of Concentration (Tc) of 6 minutes was used in the calculations, as applicable.

Drainage calculations were performed for the pre- and post-development conditions for the 1-, 2-, 10-, 25-, and 100-year 24-hour Type III storm events, and are included in **Appendix D**, in accordance with the Town of Arlington's, Town of Lexington's, and the Massachusetts Department of Environmental Protection's Stormwater Management Regulations. The total rainfall for each of the storm events was based upon data published by the Northeast Regional Climate Center (NRCC) and Natural Resources Conservation Service (NRCS) entitled *Extreme Precipitation in New York and New England* found at http://precip.eas.cornell.edu/. The total precipitation depth for the project site associated with each rainfall event is outlined in **Table 2-1**, below.

Table 2-1: Design Rainfall Data

Type III 24-Hour Storm Event (Frequency)	Rainfall Depth (Inches)
1-Year	2.67
2-Year	3.21
10-Year	4.86
25-Year	6.17
100-Year	8.85

A copy of the NRCC and NRCS Extreme Precipitation Table for the project Site is included in **Appendix A**.

In addition to the above analysis, this site was also evaluated using National Oceanic and Atmospheric Administration (NOAA) Atlas plus rainfall depth and distribution data. Discussion and a summary of results for this additional analysis can be found in **Section 2.4** and model result data can also be found in **Appendix D**

2.2 Hydraulic Model Description

A stormwater model has been developed to compare the peak runoff rates from the pre-development site to the peak runoff rates anticipated from the post-development site. As further described herein, the model demonstrates that the post-development runoff rates will not exceed pre-development rates.

2.2.1 Design Points

Existing and proposed subcatchments were delineated in order to compare pre- and post-development peak rates of runoff. Although the size of each subcatchment differs slightly between the existing and proposed site conditions, the total area analyzed between the two conditions remained the same. A Design Point was established for each

watershed, symbolizing the area's ultimate stormwater discharge location. For this analysis, two watershed areas were identified, and therefore two Design Points were chosen, as follows:

- Design Point 1 (DP-1): represents runoff discharging to the Arlington Reservoir and Swimming Area.
- Design Point 2 (DP-2): represents runoff discharging to the ditch located north of the property at 202 Lowell Street.

The locations of the Design Points do not differ in the pre- and post-development analyses, as seen in the figures located in **Appendix C**.

2.2.2 Pre-Development Conditions

The pre-development project area consists of a swimming area, sandy beach, bathhouse, vending machines, concession area, playground, pump station building, walking paths, benches, lifeguard stands, a 0.5-acre gravel parking lot, a small paved parking lot, and various other Site features. Existing grassed areas on-Site were modeled to be in "fair" condition, as much of the grassed surfaces are currently covered in beach sand and therefore are not likely infiltrating groundwater as efficiently as grass in "good" condition would be.

Per Article 15 – Storm Water Mitigation of the Town of Arlington's Title V – Regulations Upon the Use of Private Property Bylaws, impervious surfaces are defined as "a hard-surfaced, human-made area that does not readily absorb or retain water, preventing the infiltration of storm water runoff; including but not limited to…parking and driveway areas…" Upon review of existing conditions at the site, it appears the 0.5-acre gravel parking lot on the southern half of the Site exhibits the hydrologic characteristics one would expect with an impervious surface. Ponded water has been observed on the gravel surface several days after rain events due to its inability to infiltrate to the soil below. Based on this review and Article 15 of the Town of Arlington's Title V Bylaws, the gravel parking area has been considered impervious for the purposes of this stormwater analysis.

The pre-development watershed area is approximately 5.42 acres in size. There are no existing stormwater BMPs on-Site; stormwater runoff from the three subcatchments within the project area is conveyed via overland flow to their respective design points, as described below:

- *Subcatchment 1:* Subcatchment 1 encompasses the northern portion of the Site, including the playground, beach, and parking lots. Stormwater runoff from subcatchment 1 flows via overland flow from east to west before discharging into the Arlington Reservoir and Swimming Area (DP-1), which is classified by MassDEP as a critical area. The area is approximately 5.22 acres in size; land cover is primarily comprised of grass, beach sand, surface water, and impervious gravel with smaller areas of brush, impervious structures, and sand pathways. The calculated weighted curve number for this subcatchment is 71.
- *Subcatchment 2:* Subcatchment 2 encompasses the southern-most portion of the 0.5-acre gravel parking area. Stormwater runoff from subcatchment 3 flows via overland flow from north to south before discharging into the ditch just north of the property at 202 Lowell Street (DP-2). The area is approximately 0.20 acre in size; land cover is primarily comprised of impervious gravel, grass, and brush, with smaller areas of impervious surfaces. The calculated weighted curve number for this subcatchment is 64.

The subcatchment areas and their associated design points are illustrated on the Pre-Development Watershed Figure provided in **Appendix C** of this Report.

2.2.3 Post-Development Conditions

The post-development project area will consist of a swimming area, sandy beach, renovated bathhouse, vending machine, and concession area, a newly-paved picnic pavilion and drop-off area, a new check-in area, permeable multi-surface athletic court, playground, lifeguard stands, walking paths, restored grass areas, 21,500 square-foot porous pavement parking lot, and various other Site features. The new walking paths around the project area will be ADA-accessible and will allow increased Site access not currently provided in the Site's existing condition. The porous pavement parking lot is described in further detail in Section 2.2.4.

Similar to the pre-development model, the post-development watershed area is also 5.42 acres in size. Stormwater runoff from the two subcatchments will flow to its respective design points, as described below:

- *Subcatchment 1:* Subcatchment 1 will encompass the northern portion of the Site, including the playground, beach, and parking lots. Stormwater runoff from subcatchment 1 will flow via overland flow from east to west before either discharging directly into Arlington Reservoir and Swimming Area (DP-1) or into the porous pavement system proposed for installation over the Site's southern parking area. Stormwater entering the porous pavement system will either infiltrate into the ground or, during large storm events, will be collected by the system's underdrain and discharged towards Arlington Reservoir. The subcatchment area will be approximately 5.32 acres in size; land cover will be primarily comprised of grass, surface water, beach sand, porous asphalt pavement, and various impervious surfaces (including standard asphalt pavement, concrete walkways, and structures), with smaller areas of brush, permeable playground and athletic court surfaces, and stone dust. The calculated weighted curve number for this subcatchment is 69.

- *Subcatchment 2:* Subcatchment 2 will encompass the area south of the porous pavement parking area. Stormwater runoff from subcatchment 2 will flow via overland flow from north to south before discharging into the ditch just north of the property at 202 Lowell Street (DP-2). The area will be approximately 0.10 acre in size; land cover will be entirely comprised of grass. The calculated weighted curve number for this subcatchment is 39.

The subcatchment areas and their associated design points are illustrated on the Post-Development Watershed Figure provided in **Appendix D** of this Report.

2.2.4 Low Impact Development Technique – Porous Pavement

Porous pavement was selected as a Low Impact Development (LID) technique for this Site in accordance with the Arlington Reservoir Master Plan written by Weston & Sampson in 2018. The proposed 21,500 square-foot porous pavement parking lot will replace the existing impervious gravel lot, which will provide a stabilized parking area and minimize the amount of maintenance required to upkeep the parking lot and reduce the amount sediment transported into Arlington Reservoir during post-construction conditions. Stormwater directed to the porous pavement will filter through the system's asphalt, choker, and pea gravel courses and enter the reservoir course, designed to provide storage capacity while stormwater infiltrates into the soils beneath the system. The bottom of the reservoir course was designed at elevation 161.40, providing a 2-foot separation from the highest seasonal high groundwater table elevation observed during test pitting activities conducted at the Site. A four-inch PVC underdrain and three grate inlets will be installed within the western-most portion of the system's reservoir course to provide an outlet for stormwater during extreme storm events. The invert of these outlets was designed at the 100-year storm elevation within the porous pavement BMP, meaning rainfall greater than the 100-year storm will flow through the reservoir course of the pavement system to the PVC underdrain and grate inlets and will discharge to the Arlington Reservoir (DP-1).

Volume 1, Chapter 1 of the Massachusetts Stormwater Handbook does not list porous pavement as an approved stormwater BMP for discharges near bathing beaches and Volume 2, Chapter 2 of the Handbook states that porous

pavement shall be set back at least 100 feet from surface waters to receive any water quality credit. Existing Site constraints, including the lack of available area to install stormwater BMPs and the proximity to surface water across the entire project area, inhibit the use of many typical BMPs. Although porous pavement is not a listed BMP for bathing beaches, its use can be implemented within the project area and it will improve stormwater treatment at the Site by increasing water quality volume, annual recharge, and removal of total suspended solids (TSS) in the post-development Site condition.

2.3 Peak Discharge Rates and Runoff Volumes

The tables below summarize the pre- and post-development peak discharge rates and runoff volumes for each Design Point.

Table 2-2: Pre- and Post-Development Peak Discharge Rates

Design Point	1-year (cfs)			2-year (cfs)			10-year (cfs)			25-year (cfs)			100-year (cfs)		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP-1	2.96	1.65	**-1.31**	4.93	3.15	**-1.78**	12.11	8.92	**-3.19**	18.53	14.29	**-4.24**	32.53	26.30	**-6.23**
DP-2	0.04	0.00	**-0.04**	0.10	0.00	**-0.10**	0.33	0.00	**-0.33**	0.54	0.02	**-0.52**	1.04	0.13	**-0.91**

Note: Δ stands for net difference between the pre- and post-development rates.

Table 2-3: Pre- and Post-Development Runoff Volumes

Design Point	1-year (af)			2-year (af)			10-year (af)			25-year (af)			100-year (af)		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
DP-1	0.25	0.17	**-0.08**	0.38	0.27	**-0.11**	0.87	0.66	**-0.21**	1.32	1.03	**-0.29**	2.32	1.87	**-0.45**
DP-2	0.00	0.00	**0.00**	0.00	0.00	**0.00**	0.03	0.00	**-0.03**	0.04	0.00	**-0.04**	0.07	0.01	**-0.06**

Note: Δ stands for net difference between the pre- and post-development volumes.

Table 2-2 demonstrates a decrease in peak discharge rates between the existing and proposed site conditions for all scenarios shown above; **Table 2-3** demonstrates a decrease in runoff volumes between the existing and proposed site conditions for all scenarios shown above. Complete copies of the pre- and post-development HydroCAD computer model outputs demonstrating that peak discharge rates and runoff volumes decrease between the existing and proposed Site conditions are included in **Appendix D**.

2.4 NOAA Atlas 14 Plus Evaluation

Currently, the Massachusetts Department of Environmental Protection (MassDEP) is considering changing their current regulations to specify the use of NOAA Atlas 14 Plus data for use in stormwater modeling. Overall the modeling methodology will stay the same as described in Section 4.1, but updated rainfall depths and distribution curves have been established in order to better capture the effect of climate change along with the addition of several years of new data. The rainfall totals are calculated by multiplying the Upper Confidence of the standard NOAA Atlas 14 precipitation frequency estimates by 0.9. Rainfall depths used in this analysis can be found below in **Table 2-4**. In addition to the rainfall depths, NOAA guidelines stipulate the use of rainfall distributions curves created by the NRCS Water Quality and Quantity Development Team. These curves are based on geographic area and specifies the use of rainfall distribution curve "D" for areas in Arlington and Lexington, MA. Results of the NOAA Atlas 14 Plus analysis can be found below in **Table 2-5**.

Table 2-4: Design Rainfall Data

NOAA 24-Hour Storm Event (Frequency)	Rainfall Depth (Inches)
1-Year	2.93
2-Year	3.64
10-Year	5.79
25-Year	7.48
100-Year	10.35

Table 2-5: NOAA Atlas 14 Plus Results

Rainfall Event	DP-1			DP-2		
	Pre(cfs)	Post(cfs)	Δ	Pre(cfs)	Post(cfs)	Δ
1	3.86	2.38	**-1.48**	0.07	0.00	**-0.07**
2	6.51	4.47	**-2.04**	0.15	0.00	**-0.15**
10	15.91	12.22	**-3.69**	0.46	0.01	**-0.45**
25	24.00	19.13	**-4.87**	0.75	0.06	**-0.69**
100	38.24	31.54	**-6.70**	1.27	0.21	**-1.06**

As can be seen in **Table 2-5**, the results from the NOAA Atlas 14 Plus analysis closely mirror those of the previous NRCC Extreme Precipitation results. Furthermore, the analysis does not give any reason for concern about the stormwater system due to the larger rainfall depths calculated from the NOAA data. While the total rainfall depths are significantly different, especially seen during large events, the rainfall distributions used with the NOAA data create similar peak flowrates as seen with NRCC Extreme Precipitation data used with a Soil Conservation Service (SCS) Type III rainfall distribution.

3. COMPLIANCE WITH STORMWATER MANAGEMENT STANDARDS

Volume 1, Chapter 1 of the Massachusetts Stormwater Handbook states:

> *"For purposes of the Stormwater Management Standards, redevelopment projects are defined to include…maintenance and improvement of existing roadways, including widening less than a single lane, adding shoulders, correcting substandard intersections, improving existing drainage systems, and repaving."*

By this definition, the Arlington Reservoir Phase 2 project is considered a redevelopment project, meaning certain Standards included in the Massachusetts Stormwater Handbook only need to be met to the maximum extent practicable (as defined by Standard 7). The following sections further detail applicability of these Stormwater Management Standards and demonstrates that the proposed Arlington Reservoir – Phase 2 Project complies with these requirements.

3.1 Standard 1: No New Untreated Discharges

"No new stormwater conveyances (e.g. outfalls) will discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth."

In the existing site condition, stormwater is generally transported via overland flow towards the Arlington Reservoir and Swimming Area (DP-1) and the ditch just north of the property at 202 Lowell Street (DP-2). Runoff from the project area is not currently treated prior to discharge. The proposed site improvements will not create any new untreated stormwater discharges and will result in a net decrease in impervious area of approximately 18,000 square feet. Stormwater runoff from Site will be either conveyed via overland flow to Design Points, similar to existing condition drainage patterns, or will be treated by a new porous pavement system prior to infiltrating into the ground or, during extreme storms greater than the 100-year event, discharging into the Arlington Reservoir (DP-1) after filter treatment. There are no proposed untreated stormwater discharges that will cause erosion in or to wetlands or waters of the Commonwealth. This Standard has been met.

3.2 Standard 2: Peak Rate Attenuation

"Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates."

Calculations are provided to show that the post-development peak discharge rates do not exceed pre-development rates for the 1-, 2-, 10-, 25-, and 100-year 24-hour storm events. A detailed description of both the existing and proposed Site conditions are located in Section 2.2 of this report. Copies of the existing and proposed HydroCAD computer model outputs demonstrating that this standard has been met are included in **Appendix D**.

3.3 Standard 3: Recharge

"Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This condition is met when the stormwater management system is designed to infiltrate the required volume as determined in accordance with the Massachusetts Stormwater Handbook."

The proposed improvements will decrease the amount of impervious area across the project Site by approximately 18,000 square feet. No additional groundwater recharge volume is required, however, installation of porous pavement over the existing gravel parking lot in the southern portion of the Site and restoration of grass areas throughout the Site

are proposed as part of this project. The porous pavement and restored grass areas will increase stormwater infiltration, and therefore annual recharge, in the post-development Site condition.

3.4 Standard 4: Water Quality

"Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when: (a) Suitable practices for source control and pollution prevention are identified in long-term pollution prevention plan, and thereafter implemented and maintained; (b) Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and (c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook."

Existing Site conditions provide 0% TSS removal. The Town of Arlington is proposing to install a porous pavement system over the existing gravel parking lot in the southern portion of the Site. The system will increase water quality volume and remove TSS from the stormwater runoff produced from the proposed parking lot area and the adjacent grass area to the east sloping downward from Lowell Street in the post-development Site condition. During storm events, stormwater will filter through the porous pavement system's asphalt, choker, and pea gravel courses and enter the reservoir course, designed to provide storage capacity while stormwater infiltrates into the soils beneath the system.

According to Volume 2, Chapter 2 of the Massachusetts Stormwater Handbook, porous pavement systems can remove up to 80% of TSS if the reservoir course is designed to hold the Site's required water quality volume and to drain within 72 hours of a storm event. The proposed Site improvements will decrease the amount of impervious area across the project Site by approximately 18,000 square feet, and therefore no additional water quality volume is required on-Site. However, the porous pavement system's reservoir course has been designed to store the 100-year storm event and to drain within 26 hours of the 100-year event. Therefore, it can be assumed that the proposed porous pavement system will remove up to 80% of the TSS in stormwater runoff discharging to the system. On other parts of the proposed project Site, this Standard is met to the maximum extent practicable by not creating any new untreated stormwater discharges.

An Operations and Maintenance Plan is provided in **Appendix E**, which specifies suitable practices for source control and long-term pollution prevention.

3.5 Standard 5: Land Uses with Higher Potential Pollutant Loads

"For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt, and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such uses as provided in the Massachusetts Stormwater Handbook."

The proposed project is not considered a Land Use with Higher Potential Pollutant Loads; therefore, this standard does not apply.

3.6 Standard 6: Critical Areas

"Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas as provided in the Massachusetts Stormwater Handbook."

Per the Massachusetts Stormwater Handbook, the Arlington Reservoir and associated Swimming Area on the eastern shore of the Reservoir are classified as critical areas. These surface water features are described throughout this report as DP-1 and will receive stormwater discharges from subcatchment 1 in the post-development Site condition. Critical areas have specific stormwater analysis guidelines, requiring the use of certain pollution prevention measures and BMPs to the maximum extent practicable for redevelopment projects. Compliance with these guidelines is discussed below:

- Standard 6 requires BMP trains discharging to critical areas to remove 80% of TSS prior to discharge. There are no existing stormwater BMPs located in subcatchment 1. In the proposed Site condition, the majority of stormwater runoff from subcatchment 1 will travel, via overland flow, to the Reservoir and Swimming Area by passing over grassed areas and beach sand prior to discharging into DP-1. This stormwater runoff will not be treated by a stormwater BMP, similar to existing Site conditions. Stormwater runoff produced from the proposed porous parking lot area and the adjacent grass area to the east sloping downward from Lowell Street will filter through the porous pavement system, during which 80% of TSS will be removed.

- A water quality depth of one-inch (1") must be used for water quality volume calculations in critical areas. The proposed Site improvements will decrease the amount of impervious area across the project Site by approximately 18,000 square feet, and therefore no additional water quality volume is required on-Site.

The proposed Site improvements meet this Standard to the maximum extent practicable.

3.7 Standard 7: Redevelopment

"A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5 and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions."

The proposed project is considered a redevelopment project and will decrease the overall impervious area on Site by approximately 18,000 square feet. The proposed work fully complies with Stormwater Management Standards 1, 2, 3, 5, 8, 9, and 10, and complies, to the maximum extent practicable, with Standards 4 and 6 as described herein.

3.8 Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

"A plan to control construction related impacts including erosion, sedimentation, and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented."

A plan to control construction-related impacts, specifically erosion and sedimentation, has been developed and is included in **Appendix F**. The proposed project has been designed to minimize land disturbance and preserve existing vegetation to the maximum extent practicable. The proposed construction BMPs have been designed in accordance with Massachusetts Erosion and Sediment Control BMPs Handbook published by MassDEP.

The Contractor will be responsible for implementing the specified erosion and sedimentation control methods. These measures will be maintained and kept in place until the disturbed areas of the project have fully stabilized. In addition, a U.S. Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Construction General Permit is required whenever construction activities will disturb one or more acres; the proposed project will disturb approximately 5.42 acres.

3.9 Standard 9: Operation and Maintenance Plan

"A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed."

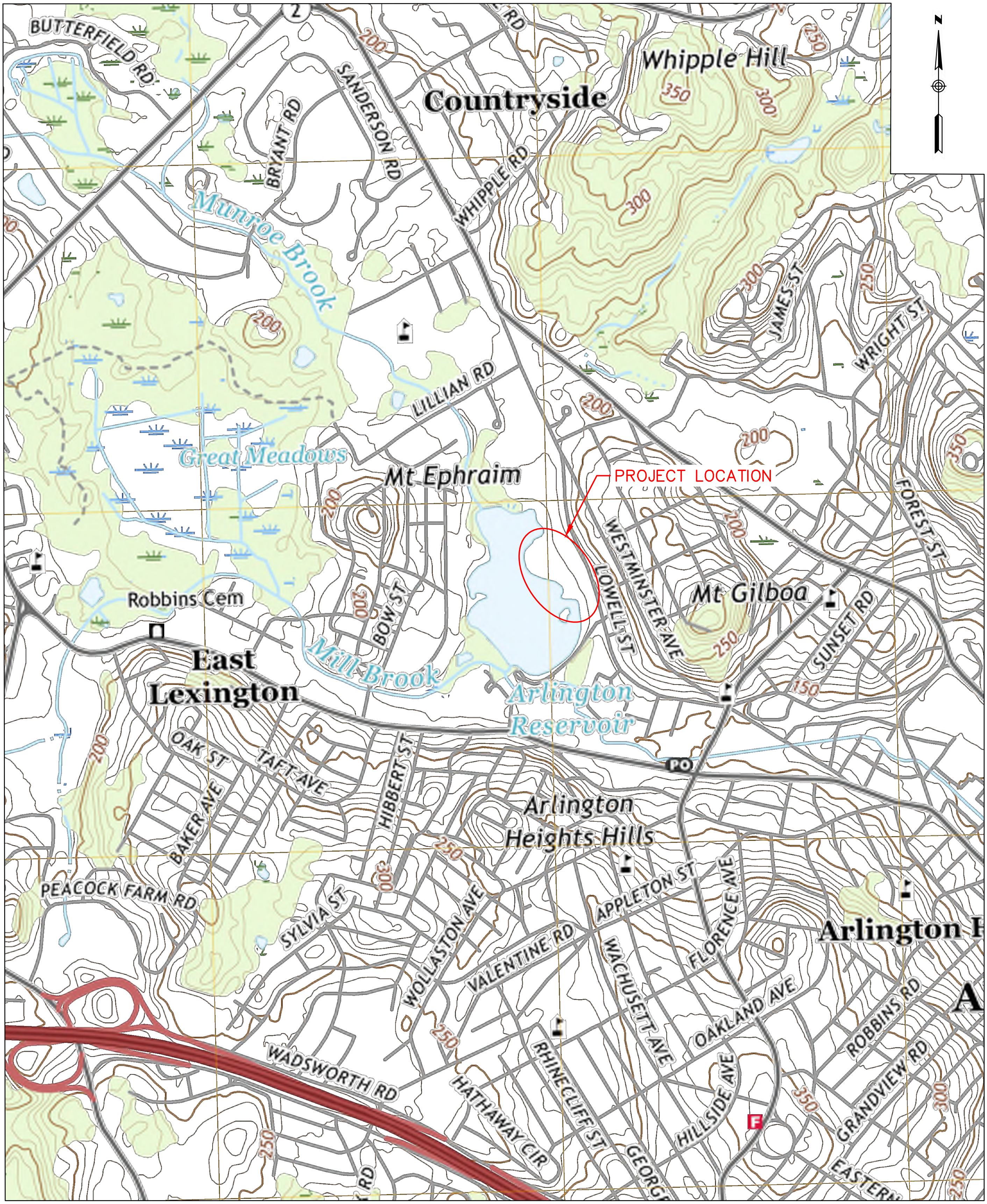
A long-term Operation and Maintenance Plan is included in **Appendix E** of this report.

3.10 Standard 10: Prohibition of Illicit Discharges

Standard 10 states that "All illicit discharges to the stormwater management system are prohibited."

The project will not result in any new illicit discharges. An Illicit Discharge Compliance Statement will be submitted prior to construction.

APPENDIX A: ENVIRONMENTAL RESOURCE DOCUMENTATION



NOTES:

1. BASE MAP TAKEN FROM UNITED STATES GEOLOGICAL SERVICES, DATED 2018. ACCESSED ON SEPTEMBER 15, 2020.

WOODARD & CURRAN
40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

ARLINGTON RESERVOIR PHASE 2
LOCUS MAP

DESIGNED BY: LLT	CHECKED BY: BSM
DRAWN BY: LLT	2020.09.15 LOCUS MAP.dwg

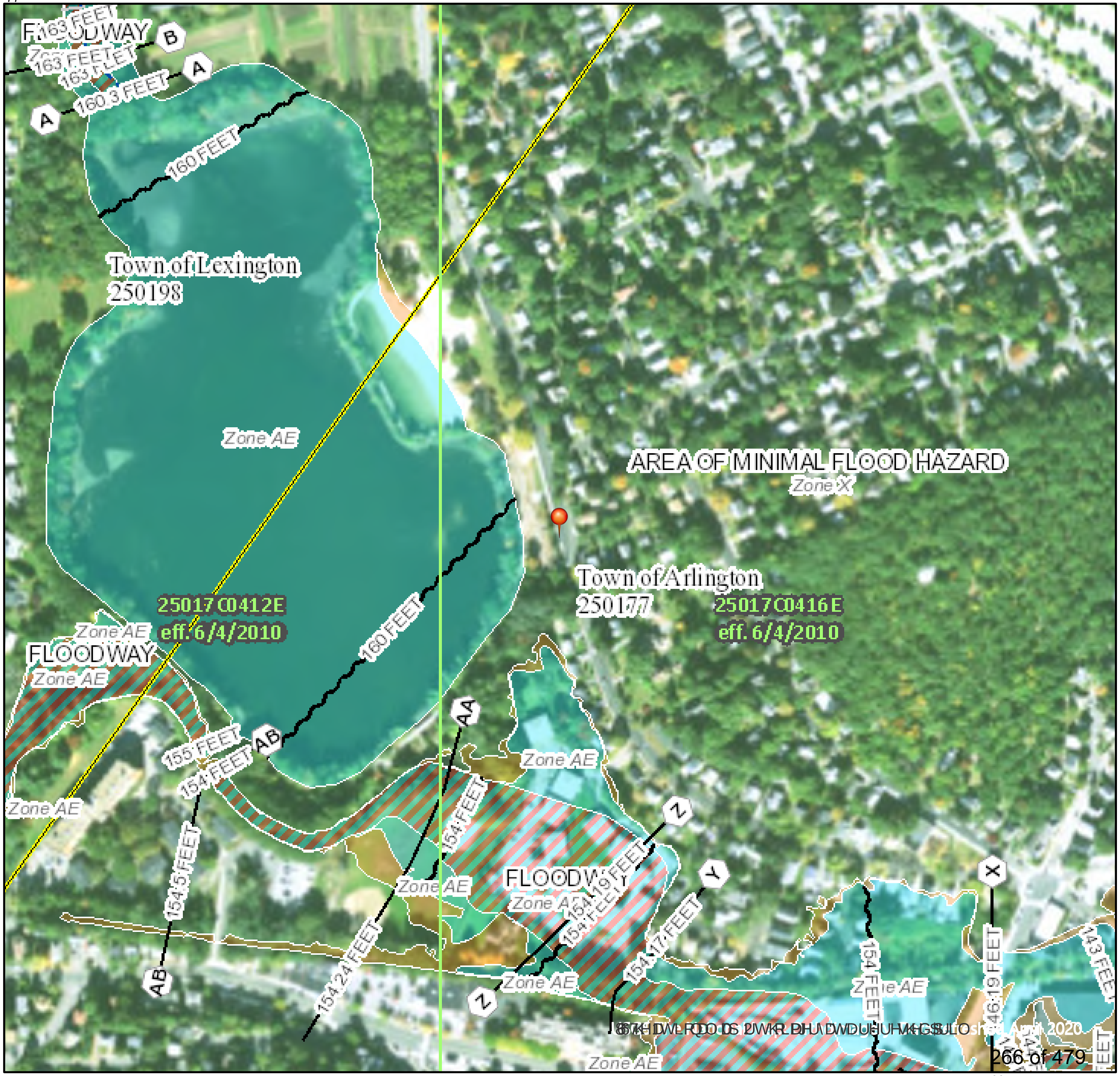
TOWN OF ARLINGTON, MA
51 GROVE STREET
ARLINGTON, MA 02476

ARLINGTON RESERVOIR
210 LOWELL ST, ARLINGTON, MA

JOB NO: 0233115.00
DATE: SEPTEMBER 2020
SCALE: N.T.S.

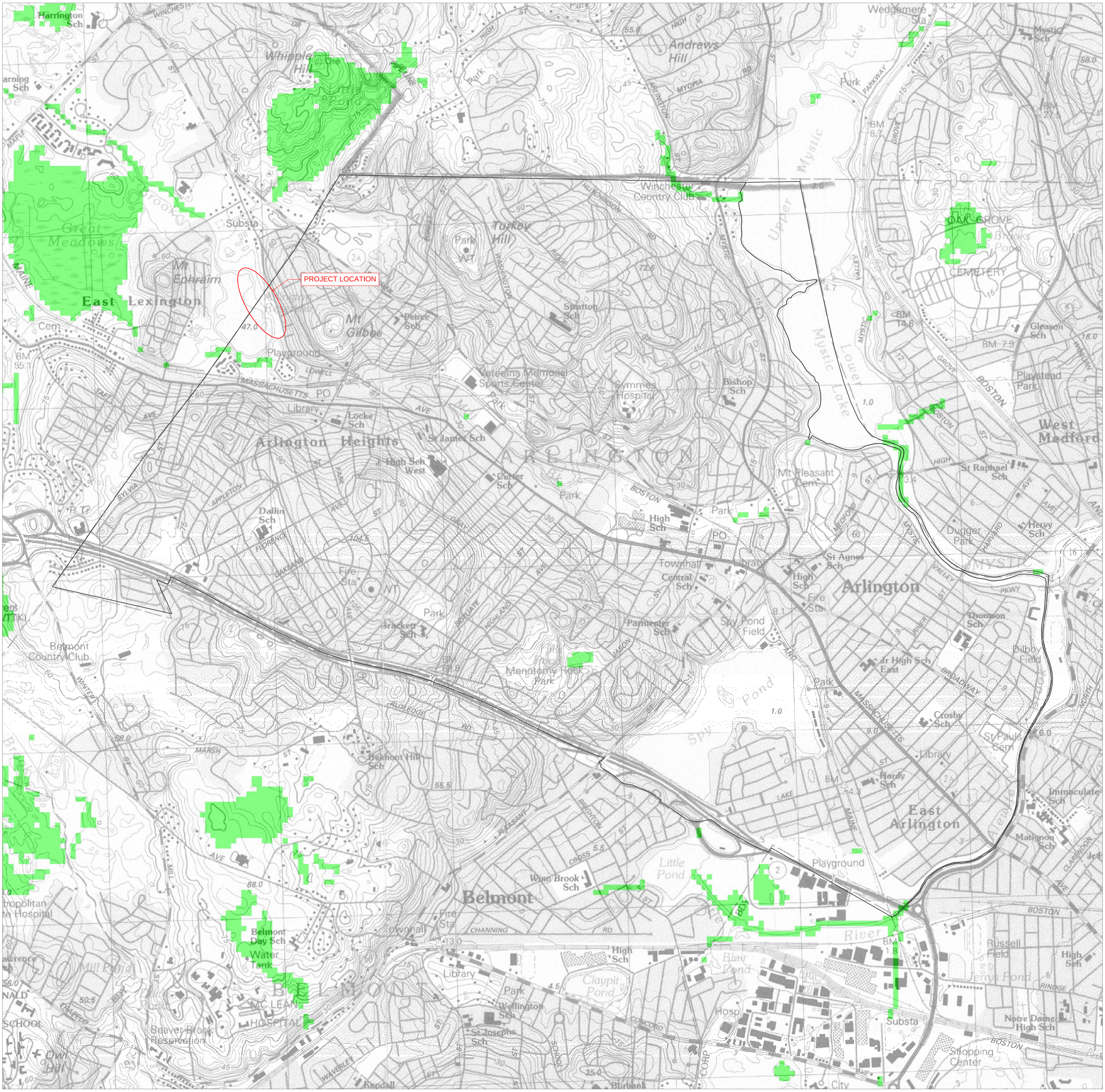
FIGURE 1

FEMA



FLOODWAY
163 FEET
163 FEET
163 FEET
160.3 FEET
160 FEET
Town of Lexington
250198
Zone AE
AREA OF MINIMAL FLOOD HAZARD
Zone X
Town of Arlington
250177
25017C0412E
eff. 6/4/2010
25017C0416E
eff. 6/4/2010
FLOODWAY
155 FEET
154 FEET
154.5 FEET
154 FEET
154.24 FEET
154.19 FEET
154.17 FEET
154 FEET
154.19 FEET
143 FEET

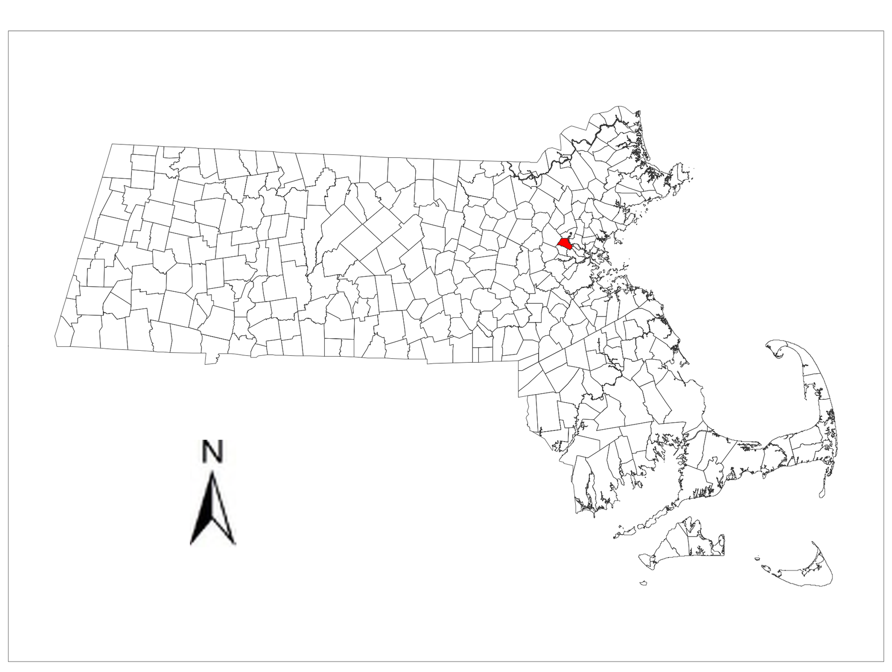
Habitat of Potential Regional or Statewide Importance
Town of ARLINGTON, MA



0 0.5 1 2 Miles

Important Wildlife Habitat

Updated November 2011



The MassDEP’s Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands, June 2006 adopted a new approach for assessing wildlife habitat impacts associated with work in wetlands. This approach utilizes maps developed at the University of Massachusetts Amherst using the Conservation Assessment and Prioritization System (CAPS). The maps depict “Habitat of Potential Regional or Statewide Importance” that may trigger more intensive levels of review. For more information on how to assess wildlife habitat impacts, see Section III of the Guidance document: http://www.mass.gov/dep/water/laws/wldhab.pdf.

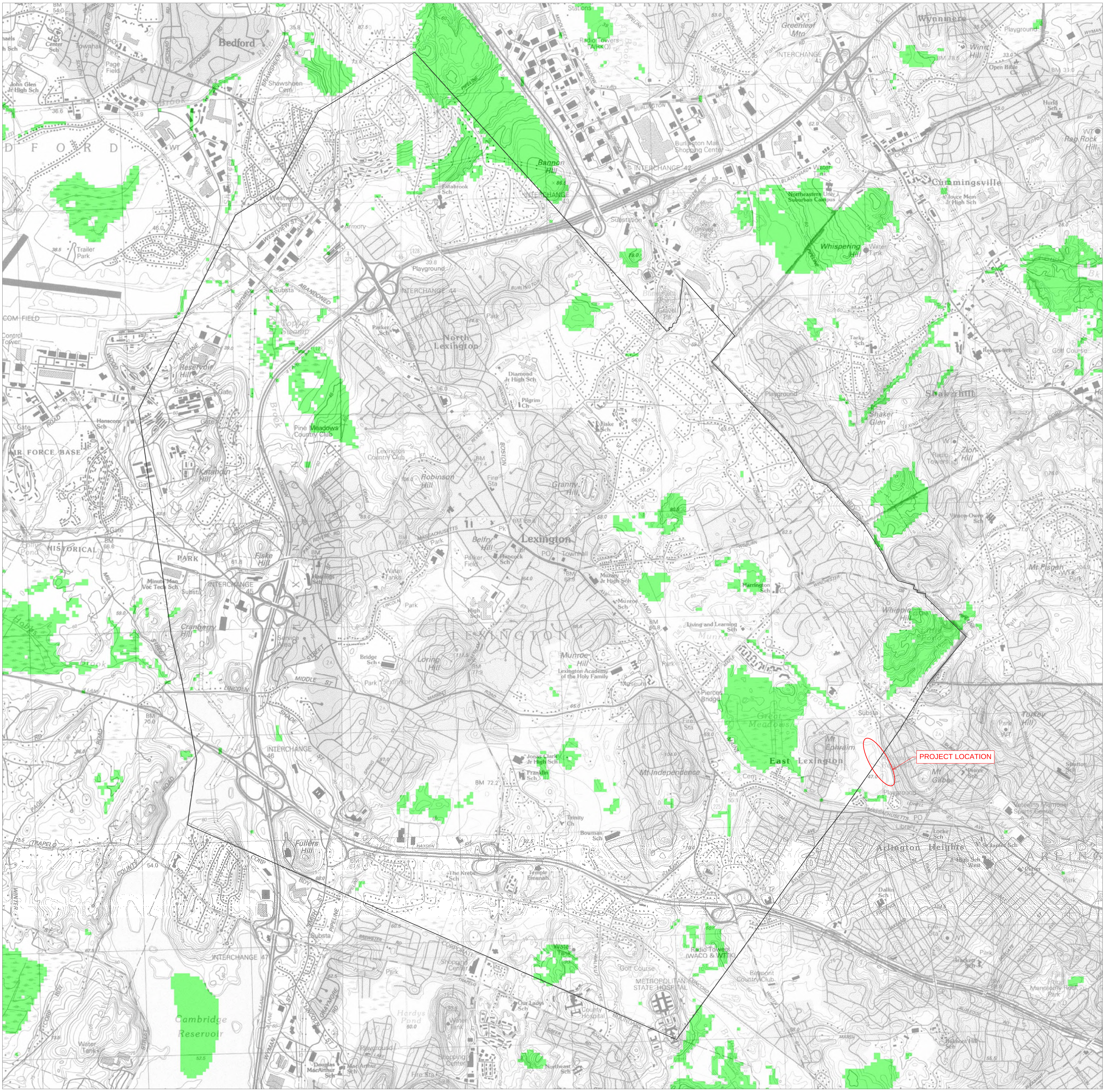
The CAPS model assesses the ecological integrity of Massachusetts landscape features as influenced by environmental stressor metrics (e.g. pollution, fragmentation). CAPS relies on data that are broadly available across Massachusetts. Ecological features which are not consistently surveyed or uniformly available, such as certified vernal pools, rare species, and contamination sites are not included in CAPS. When available, this more specific ecological information may be used in conjunction with the CAPS outputs to better understand particular sites in Massachusetts and support informed conservation decision-making. For more information on the statewide maps produced by the CAPS model, see: http://www.masscaps.org.

These maps are funded in part by the Massachusetts Executive Office of Energy and Environmental Affairs, the Massachusetts Department of Environmental Protection and the U.S. Environmental Protection Agency under section 104 (b)(3) of the U.S. Clean Water Act. Environmental data sources include the Office of Geographic and Environmental Information (MassGIS).

MassDEP

UMass Extension
CENTER FOR AGRICULTURE

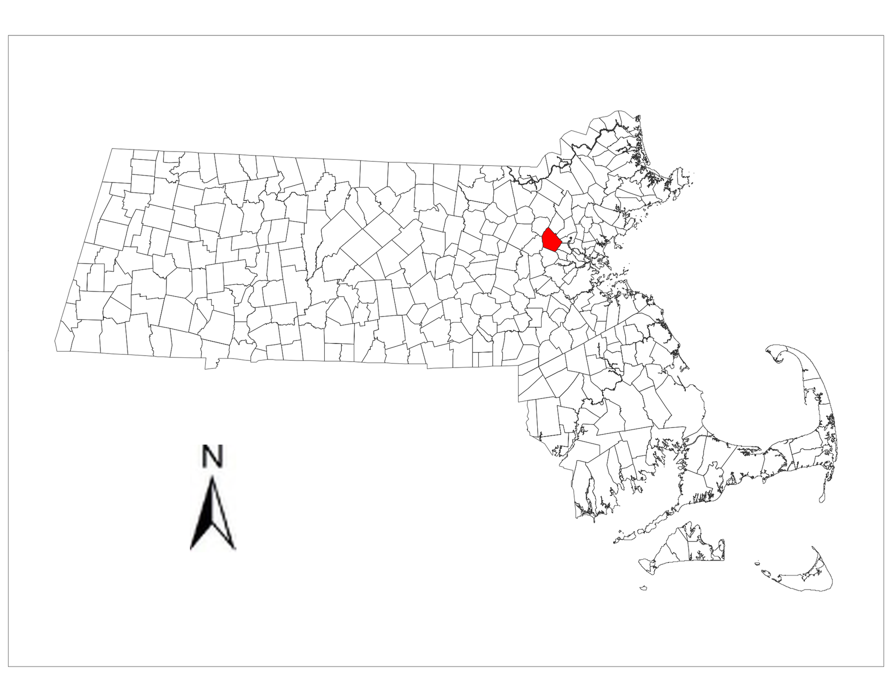
Habitat of Potential Regional or Statewide Importance
Town of LEXINGTON, MA



0 0.5 1 2 Miles

Important Wildlife Habitat

Updated November 2011



The MassDEP's Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands, June 2006 adopted a new approach for assessing wildlife habitat impacts associated with work in wetlands. This approach utilizes maps developed at the University of Massachusetts Amherst using the Conservation Assessment and Prioritization System (CAPS). The maps depict "Habitat of Potential Regional or Statewide Importance" that may trigger more intensive levels of review. For more information on how to assess wildlife habitat impacts, see Section III of the Guidance document: http://www.mass.gov/dep/water/laws/wldhab.pdf.

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MassDEP

UMass Extension
CENTER FOR AGRICULTURE

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	Massachusetts
Location	
Longitude	71.187 degrees West
Latitude	42.428 degrees North
Elevation	0 feet
Date/Time	Thu, 10 Sep 2020 11:23:56 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.43	0.53	0.70	0.87	1.10	**1yr**	0.75	1.04	1.28	1.63	2.08	2.67	2.90	**1yr**	2.36	2.79	3.26	3.95	4.62	**1yr**
2yr	0.35	0.53	0.67	0.88	1.10	1.39	**2yr**	0.95	1.28	1.61	2.03	2.55	3.21	3.56	**2yr**	2.84	3.42	3.92	4.66	5.31	**2yr**
5yr	0.41	0.64	0.81	1.08	1.38	1.76	**5yr**	1.19	1.60	2.05	2.58	3.24	4.07	4.53	**5yr**	3.60	4.35	4.97	5.93	6.65	**5yr**
10yr	0.47	0.73	0.93	1.26	1.64	2.10	**10yr**	1.41	1.90	2.45	3.10	3.89	4.86	5.43	**10yr**	4.31	5.22	5.95	7.11	7.88	**10yr**
25yr	0.56	0.88	1.12	1.55	2.05	2.66	**25yr**	1.77	2.39	3.11	3.94	4.95	6.17	6.92	**25yr**	5.46	6.66	7.55	9.05	9.87	**25yr**
50yr	0.62	1.00	1.29	1.81	2.43	3.19	**50yr**	2.10	2.84	3.75	4.75	5.95	7.39	8.32	**50yr**	6.54	8.00	9.04	10.87	11.71	**50yr**
100yr	0.72	1.17	1.50	2.13	2.89	3.81	**100yr**	2.50	3.37	4.48	5.69	7.13	8.85	10.00	**100yr**	7.83	9.62	10.84	13.05	13.90	**100yr**
200yr	0.82	1.34	1.74	2.49	3.44	4.56	**200yr**	2.97	4.01	5.38	6.84	8.57	10.61	12.04	**200yr**	9.39	11.57	12.99	15.68	16.50	**200yr**
500yr	1.00	1.64	2.13	3.09	4.33	5.78	**500yr**	3.74	5.05	6.85	8.72	10.91	13.49	15.38	**500yr**	11.94	14.79	16.51	20.00	20.71	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.24	0.37	0.46	0.62	0.76	0.84	**1yr**	0.65	0.82	1.14	1.43	1.76	2.39	2.46	**1yr**	2.12	2.37	2.89	3.50	4.01	**1yr**
2yr	0.33	0.51	0.63	0.85	1.05	1.25	**2yr**	0.90	1.23	1.44	1.90	2.46	3.10	3.43	**2yr**	2.74	3.30	3.78	4.49	5.14	**2yr**
5yr	0.39	0.60	0.74	1.02	1.29	1.50	**5yr**	1.12	1.46	1.72	2.23	2.87	3.73	4.13	**5yr**	3.30	3.97	4.54	5.42	6.11	**5yr**
10yr	0.43	0.66	0.82	1.15	1.48	1.71	**10yr**	1.28	1.67	1.93	2.51	3.22	4.29	4.76	**10yr**	3.80	4.58	5.22	6.21	6.96	**10yr**
25yr	0.50	0.76	0.94	1.34	1.77	2.03	**25yr**	1.53	1.98	2.28	2.95	3.75	5.14	5.73	**25yr**	4.55	5.51	6.26	7.40	8.25	**25yr**
50yr	0.55	0.84	1.04	1.50	2.02	2.32	**50yr**	1.74	2.27	2.57	3.33	4.22	5.89	6.57	**50yr**	5.21	6.32	7.18	8.42	9.37	**50yr**
100yr	0.61	0.93	1.16	1.68	2.30	2.64	**100yr**	1.99	2.58	2.91	3.58	4.74	6.77	7.54	**100yr**	5.99	7.25	8.24	9.55	10.65	**100yr**
200yr	0.69	1.04	1.31	1.90	2.65	3.01	**200yr**	2.29	2.94	3.30	4.00	5.35	7.76	8.65	**200yr**	6.87	8.32	9.45	10.81	12.08	**200yr**
500yr	0.80	1.19	1.54	2.23	3.17	3.58	**500yr**	2.74	3.50	3.88	4.63	6.27	9.30	10.35	**500yr**	8.23	9.95	11.33	12.69	14.28	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.31	0.48	0.59	0.79	0.97	1.13	**1yr**	0.84	1.11	1.32	1.76	2.24	2.86	3.14	**1yr**	2.53	3.02	3.50	4.29	5.02	**1yr**
2yr	0.36	0.56	0.69	0.93	1.15	1.35	**2yr**	0.99	1.32	1.56	2.06	2.66	3.34	3.71	**2yr**	2.96	3.57	4.09	4.86	5.52	**2yr**
5yr	0.45	0.69	0.86	1.18	1.50	1.78	**5yr**	1.30	1.74	2.04	2.63	3.35	4.43	4.98	**5yr**	3.92	4.79	5.42	6.45	7.20	**5yr**
10yr	0.54	0.84	1.04	1.45	1.87	2.19	**10yr**	1.62	2.14	2.54	3.19	4.02	5.51	6.24	**10yr**	4.88	6.00	6.73	8.03	8.82	**10yr**
25yr	0.71	1.07	1.34	1.91	2.51	2.88	**25yr**	2.17	2.82	3.36	4.11	5.11	7.32	8.42	**25yr**	6.48	8.09	8.97	10.76	11.55	**25yr**
50yr	0.85	1.30	1.62	2.33	3.13	3.56	**50yr**	2.70	3.48	4.16	4.99	6.13	9.11	10.57	**50yr**	8.06	10.16	11.13	13.44	14.18	**50yr**
100yr	1.04	1.58	1.98	2.85	3.92	4.39	**100yr**	3.38	4.29	5.16	6.33	7.35	11.32	13.28	**100yr**	10.02	12.77	13.82	16.82	17.43	**100yr**
200yr	1.27	1.91	2.42	3.51	4.89	5.41	**200yr**	4.22	5.29	6.41	7.73	8.81	14.10	16.70	**200yr**	12.48	16.06	17.18	21.05	21.44	**200yr**
500yr	1.65	2.46	3.17	4.60	6.54	7.13	**500yr**	5.64	6.97	8.53	10.08	11.21	18.85	22.64	**500yr**	16.68	21.77	22.89	28.39	28.21	**500yr**

Powered by ACIS
Northeast Regional Climate Center

APPENDIX B: SOILS MAP AND TEST PIT LOGS

Map Scale: 1:2,280 if printed on A portrait (8.5" x 11") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Middlesex County, Massachusetts
Survey Area Data: Version 20, Jun 9, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 11, 2019—Oct 5, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Water		7.3	47.2%
253B	Hinckley loamy sand, 3 to 8 percent slopes	A	7.2	46.4%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	A	0.8	5.4%
631C	Charlton-Urban land-Hollis complex, 3 to 15 percent slopes, rocky	A	0.2	1.1%
Totals for Area of Interest			**15.5**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

A. Facility Information

Town of Arlington
Owner Name

210 Lowell Street
Street Address

Map/Lot #

Arlington
City

MA
State

02474
Zip Code

B. Site Information

1. (Check one) ☐ New Construction ☐ Upgrade ☐ Repair Test pits for drainage purposes

2. Soil Survey Available? ☒ Yes ☐ No If yes: Web Soil Survey (Source) 253B (Soil Map Unit)

   Hinckley Loamy Sand (Soil Name) — Soil Limitations:

   Sandy and gravelly glaciofluvial deposits (Soil Parent material) — Landform:

3. Surficial Geological Report Available? ☒ Yes ☐ No If yes: MassGIS Oliver (Year Published/Source) — Map Unit:

   Sand and gravel / till and bedrock
   Description of Geologic Map Unit:

4. Flood Rate Insurance Map Within a regulatory floodway? ☐ Yes ☒ No

5. Within a velocity zone? ☐ Yes ☒ No

6. Within a Mapped Wetland Area? ☐ Yes ☒ No If yes, MassGIS Wetland Data Layer: Wetland Type

7. Current Water Resource Conditions (USGS): 08/06/20 (Month/Day/ Year) Range: ☐ Above Normal ☒ Normal ☐ Below Normal

8. Other references reviewed:

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-1 (Hole #) | 08/06/20 (Date) | 7:30 AM (Time) | 70*, sunny (Weather) | ______ (Latitude) | ______ (Longitude:)

1. Land Use: Parking lot (e.g., woodland, agricultural field, vacant lot, etc.) | None (Vegetation) | Many large boulders (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-2 (Slope (%))

   Description of Location: See attached sketch

2. Soil Parent Material: Till | ______ (Landform) | ______ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body >25 feet | Drainage Way N/A feet | Wetlands >25 feet

   Property Line >10 feet | Drinking Water Well N/A feet | Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No | If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☒ Yes ☐ No | If yes: 68" Depth Weeping from Pit | ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-27	Fill										
27-38	A	Sandy Loam	10YR3/2						Massive	Friable	
38-44	B	Sandy Loam	10YR3/4						Massive	Friable	
44-84	C	Sandy Loam	10YR5/2	44"	High and Low Chroma	>2	2	10	Massive	Friable	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-2 (Hole #) 08/06/20 (Date) 7:45 AM (Time) 70*, sunny (Weather) ______ (Latitude) ______ (Longitude:)

1. Land Use: Parking lot (e.g., woodland, agricultural field, vacant lot, etc.) None (Vegetation) Many large boulders (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-2 (Slope (%))

   Description of Location: See attached sketch

2. Soil Parent Material: Till ______ (Landform) ______ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body >25 feet Drainage Way N/A feet Wetlands >25 feet

   Property Line >10 feet Drinking Water Well N/A feet Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth Weeping from Pit ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-16	Fill										
16-30	A	Sandy Loam	10YR3/2						Massive	Friable	
30-43	B	Sandy Loam	10YR6/6	30"	High and Low Chroma	>2			Massive	Friable	
43-60	C	Sandy Loam	10YR5/3				2	10	Massive	Friable	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-3 (Hole #) | 08/06/20 (Date) | 8:00 AM (Time) | 70*, sunny (Weather) | ______ (Latitude) | ______ (Longitude:)

1. Land Use: Parking lot (e.g., woodland, agricultural field, vacant lot, etc.) | None (Vegetation) | Many large boulders (Surface Stones (e.g., cobbles, stones, boulders, etc.)) | 0-2 (Slope (%))

   Description of Location: See attached sketch

2. Soil Parent Material: Till | ______ (Landform) | ______ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body >25 feet | Drainage Way N/A feet | Wetlands >25 feet
   Property Line >10 feet | Drinking Water Well N/A feet | Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth Weeping from Pit ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-9	Fill										
9-25	B	Sandy Loam	10YR6/6						Massive	Friable	
25-55	C	Sandy Loam	10YR5/3	32"	High and Low Chroma	>2	2	10	Massive	Friable	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

C. On-Site Review *(minimum of two holes required at every proposed primary and reserve disposal area)*

Deep Observation Hole Number: TP-4 (Hole #) 08/06/20 (Date) 8:30 AM (Time) 70*, sunny (Weather) ______ (Latitude) ______ (Longitude:)

1. Land Use Parking lot (e.g., woodland, agricultural field, vacant lot, etc.) None (Vegetation) Many large boulders (Surface Stones (e.g., cobbles, stones, boulders, etc.)) 0-2 (Slope (%))

   Description of Location: See attached sketch

2. Soil Parent Material: Till ______ (Landform) ______ (Position on Landscape (SU, SH, BS, FS, TS))

3. Distances from: Open Water Body >25 feet Drainage Way N/A feet Wetlands >25 feet
   Property Line >10 feet Drinking Water Well N/A feet Other ______ feet

4. Unsuitable Materials Present: ☐ Yes ☒ No If Yes: ☐ Disturbed Soil ☐ Fill Material ☐ Weathered/Fractured Rock ☐ Bedrock

5. Groundwater Observed: ☐ Yes ☒ No If yes: ______ Depth Weeping from Pit ______ Depth Standing Water in Hole

Soil Log

Depth (in)	Soil Horizon /Layer	Soil Texture (USDA	Soil Matrix: Color-Moist (Munsell)	Redoximorphic Features			Coarse Fragments % by Volume		Soil Structure	Soil Consistence (Moist)	Other
				Depth	Color	Percent	Gravel	Cobbles & Stones			
0-12	Fill										
12-61	C	Sandy Loam	10YR5/3	24"	High and Low Chroma	>2	2	10	Massive	Friable	

Additional Notes:

Commonwealth of Massachusetts
City/Town of Arlington

Form 11 - Soil Suitability Assessment for On-Site Sewage Disposal

F. Certification

I certify that I am currently approved by the Department of Environmental Protection pursuant to 310 CMR 15.017 to conduct soil evaluations and that the above analysis has been performed by me consistent with the required training, expertise and experience described in 310 CMR 15.017. I further certify that the results of my soil evaluation, as indicated in the attached Soil Evaluation Form, are accurate and in accordance with 310 CMR 15.100 through 15.107.

[signature]	08/06/20
Signature of Soil Evaluator	Date
William Hall, P.E., S.E. 13592	06/31/21
Typed or Printed Name of Soil Evaluator / License #	Expiration Date of License
Leyna Tobey - Woodard & Curran	N/A
Name of Approving Authority Witness	Approving Authority

Note: In accordance with 310 CMR 15.018(2) this form must be submitted to the approving authority within 60 days of the date of field testing, and to the designer and the property owner with Percolation Test Form 12.

Field Diagrams: Use this area for field diagrams:

See attached sketch

ARLINGTON RESERVOIR - PHASE 2

ARLINGTON, MASSACHUSETTS

TOWN OF ARLINGTON

NO.	REVISION	DATE

kzla
Kyle Zick Landscape Architecture, Inc.
36 Bromfield Street Suite 202
Boston, MA 02108
617 451-1018 Tel
www.kylezick.com

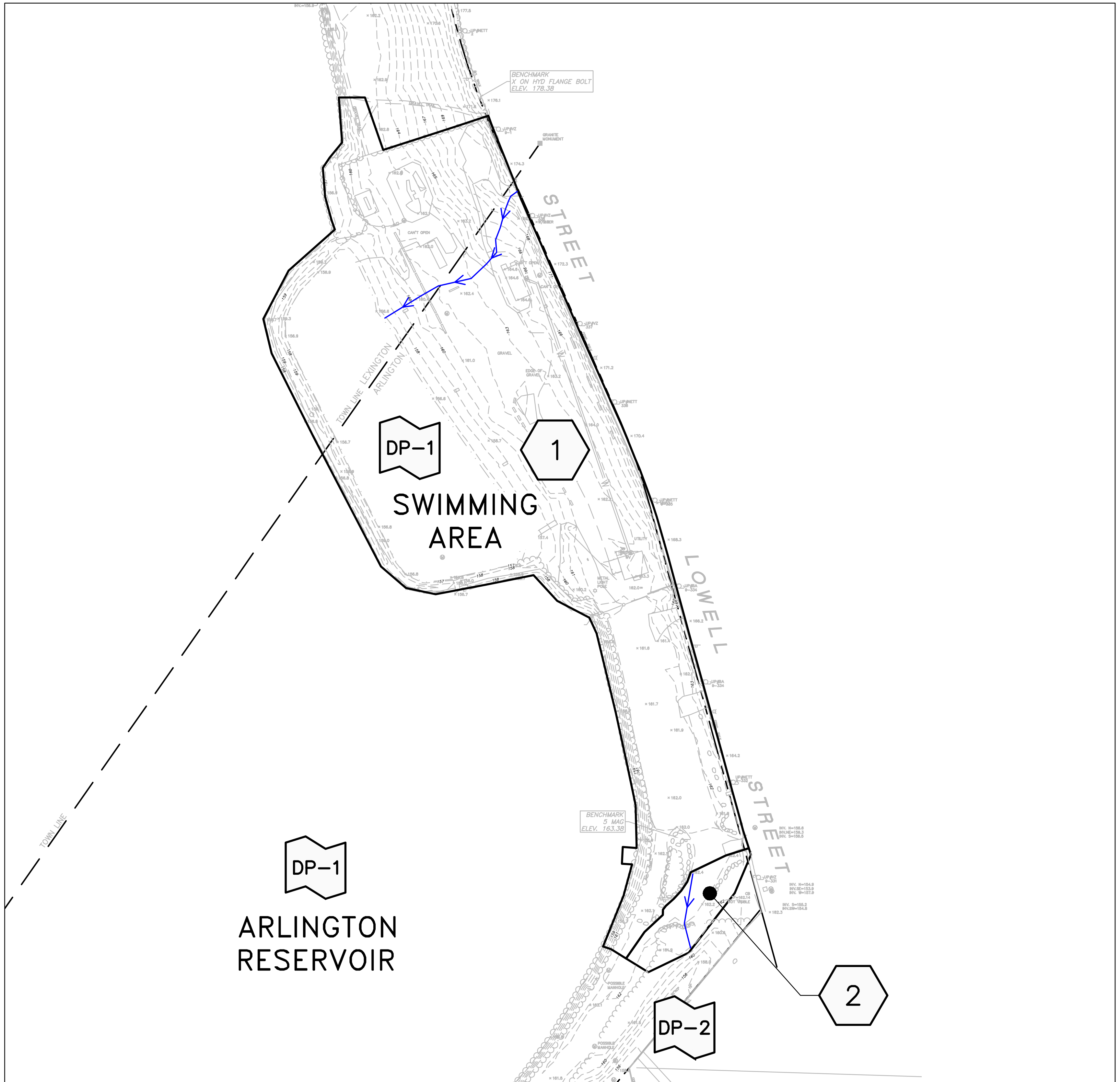
SCHEMATIC DESIGN SET

Job Number:
Project: ARLINGTON RES.
Drawn By: MD
Checked By: KZ
Date: JUNE 30, 2020
Scale: 1"=50'-0"
Drawing Title:

ENLARGEMENT PLAN

LX

APPENDIX C: STORMWATER FIGURES



N

LEGEND:

SUBCATCHMENT AREA

DESIGN POINT

LONGEST FLOW PATH

150' 0 150' 300'

BAR SCALE
1" = 150'
CHECK GRAPHIC SCALE BEFORE USING

40 Shattuck Road, Suite 110
Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS
WOODARD & CURRAN

PRE-DEVELOPMENT
CATCHMENT FIGURE

DESIGNED BY: LLT
DRAWN BY: LLT
CHECKED BY: BSM
2020.10.05 0233115.00-P*.dwg

TOWN OF ARLINGTON, MASSACHUSETTS

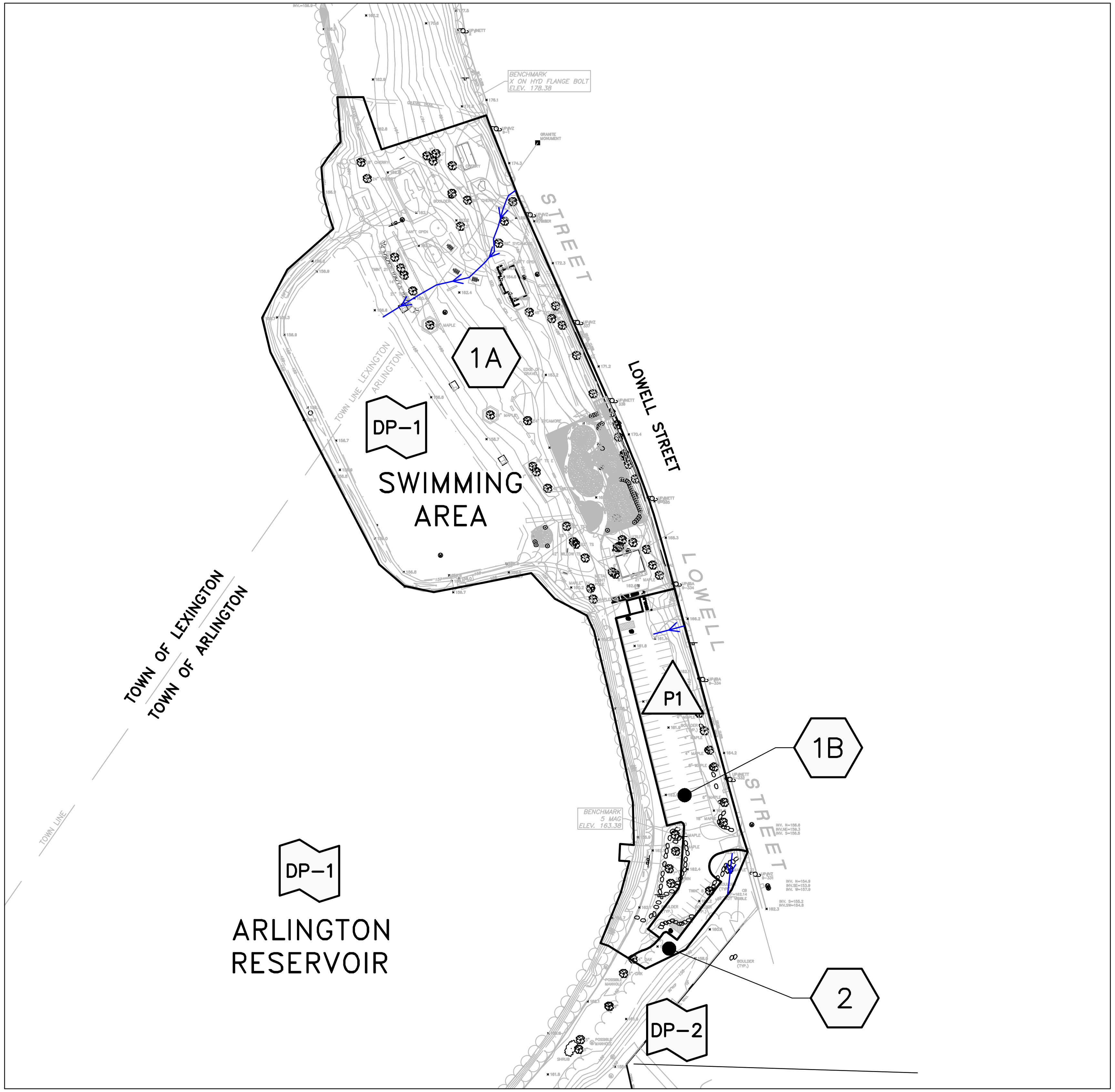
ARLINGTON RESERVOIR - PHASE 2

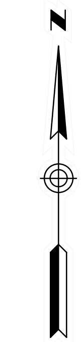
JOB NO: 0233115.00
DATE: OCTOBER 2020
SCALE: AS NOTED

FIGURE 1

\\woodardcurran.net\shared\Projects\0233115.00 KZLA Architects - Arlington Reservoir Phase 2\wip\Drawings\Civil\2020.10.05 0233115.00-PRE WATERSHED.dwg Oct 05, 2020 - 3:32pm LTOBEY

\\woodardcurran.net\shared\Projects\0233115.00 KZLA Architects – Arlington Reservoir Phase 2\wip\Drawings\Civil\2020.09.29 0233115.00-POST WATERSHED.dwg, Oct 06, 2020 – 1:51pm LTOBEY





LEGEND:

SUBCATCHMENT AREA

DESIGN POINT

POND

LONGEST FLOW PATH

150' 0 150' 300'

BAR SCALE
1" = 150'
CHECK GRAPHIC SCALE BEFORE USING

WOODARD & CURRAN
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Andover, Massachusetts 01810
866.702.6371 | www.woodardcurran.com
COMMITMENT & INTEGRITY DRIVE RESULTS

POST-DEVELOPMENT CATCHMENT FIGURE

DESIGNED BY: LLT
DRAWN BY: LLT
CHECKED BY: BSM
2020.09.29 0233115.00-P*.dwg

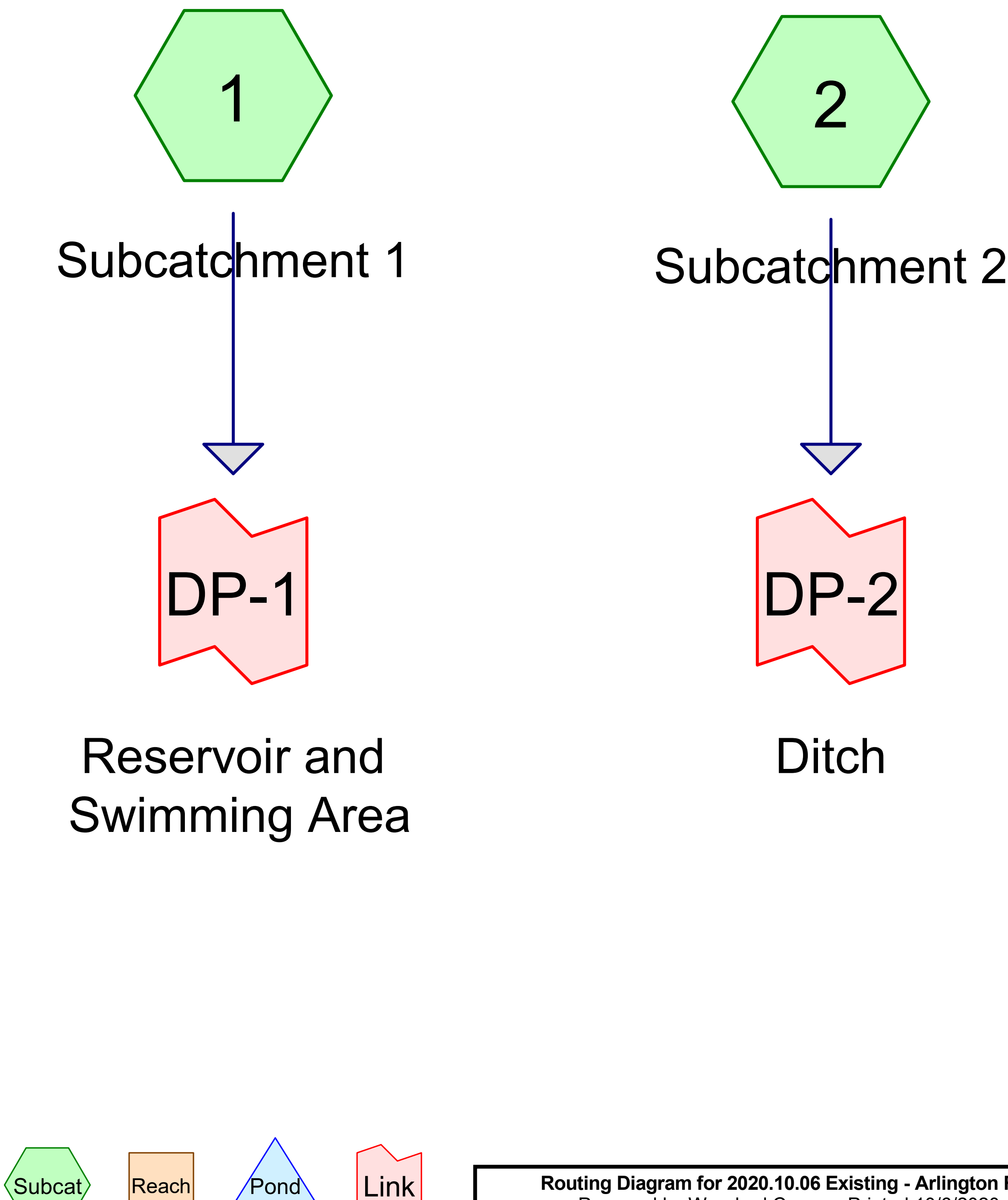
TOWN OF ARLINGTON, MASSACHUSETTS

ARLINGTON RESERVOIR – PHASE 2

JOB NO: 0233115.00
DATE: OCTOBER 2020
SCALE: AS NOTED

FIGURE 2

APPENDIX D: HYDROCAD STORMWATER MODEL REPORTS



Routing Diagram for 2020.10.06 Existing - Arlington Res
Prepared by Woodard Curran, Printed 10/6/2020
HydroCAD® 10.00-21 s/n 01204 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.531	49	50-75% Grass cover, Fair, HSG A (1, 2)
1.317	63	Beach Sand, HSG A (1)
0.379	30	Brush, Good, HSG A (1, 2)
0.046	96	Dense Sand Path, HSG A (1)
0.646	98	Gravel parking, HSG A (1, 2)
0.234	98	Impervious Surface, HSG A (1, 2)
0.055	39	Open Space, Good, HSG A (>75% Grass Cover) (1)
1.207	98	Water Surface, HSG A (1)
5.416	**70**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.416	HSG A	1, 2
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
5.416		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
1.531	0.000	0.000	0.000	0.000	1.531	50-75% Grass cover, Fair	1, 2
1.317	0.000	0.000	0.000	0.000	1.317	Beach Sand	1
0.379	0.000	0.000	0.000	0.000	0.379	Brush, Good	1, 2
0.046	0.000	0.000	0.000	0.000	0.046	Dense Sand Path	1
0.646	0.000	0.000	0.000	0.000	0.646	Gravel parking	1, 2
0.234	0.000	0.000	0.000	0.000	0.234	Impervious Surface	1, 2
0.055	0.000	0.000	0.000	0.000	0.055	Open Space, Good	1
1.207	0.000	0.000	0.000	0.000	1.207	Water Surface	1
5.416	**0.000**	**0.000**	**0.000**	**0.000**	**5.416**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=0.58"
Tc=6.0 min CN=71 Runoff=2.96 cfs 0.251 af

Subcatchment 2: Subcatchment 2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=0.33"
Tc=6.0 min CN=64 Runoff=0.04 cfs 0.006 af

Link DP-1: Reservoir and Swimming Area Inflow=2.96 cfs 0.251 af
Primary=2.96 cfs 0.251 af

Link DP-2: Ditch Inflow=0.04 cfs 0.006 af
Primary=0.04 cfs 0.006 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.257 af Average Runoff Depth = 0.57"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

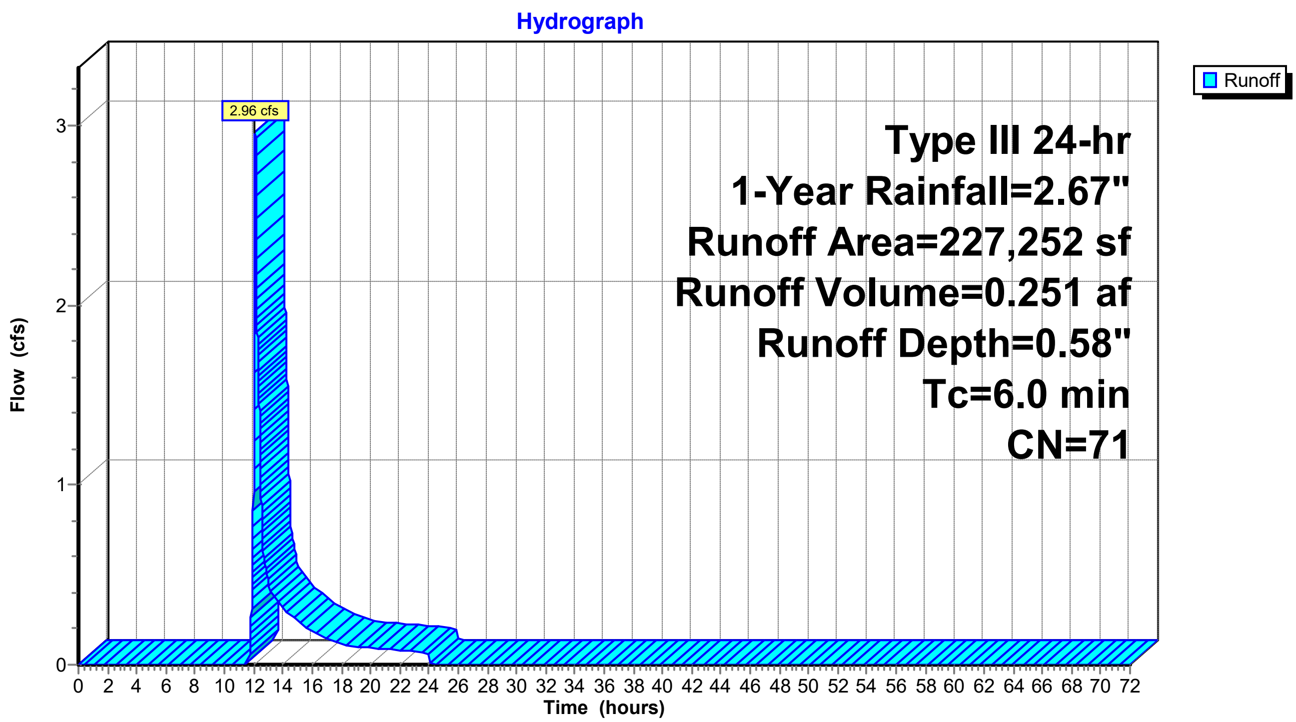
Runoff = 2.96 cfs @ 12.10 hrs, Volume= 0.251 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.67"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

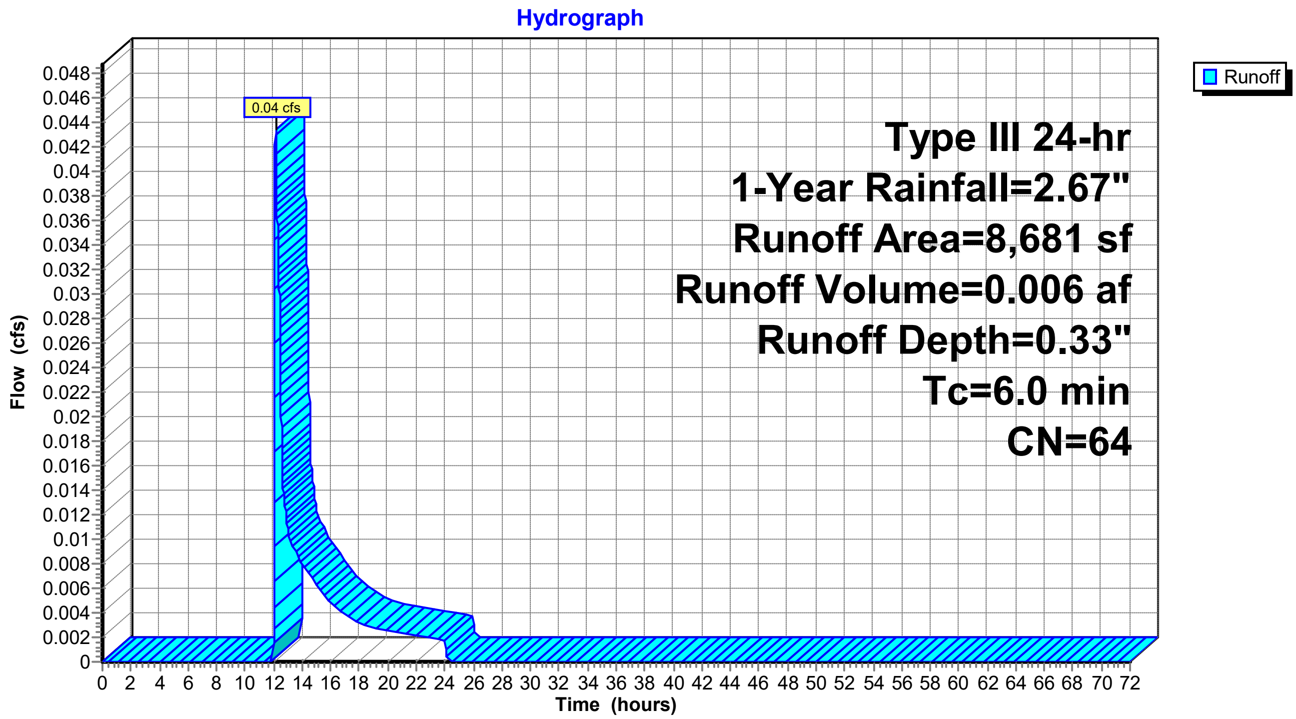
Runoff = 0.04 cfs @ 12.13 hrs, Volume= 0.006 af, Depth= 0.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.67"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

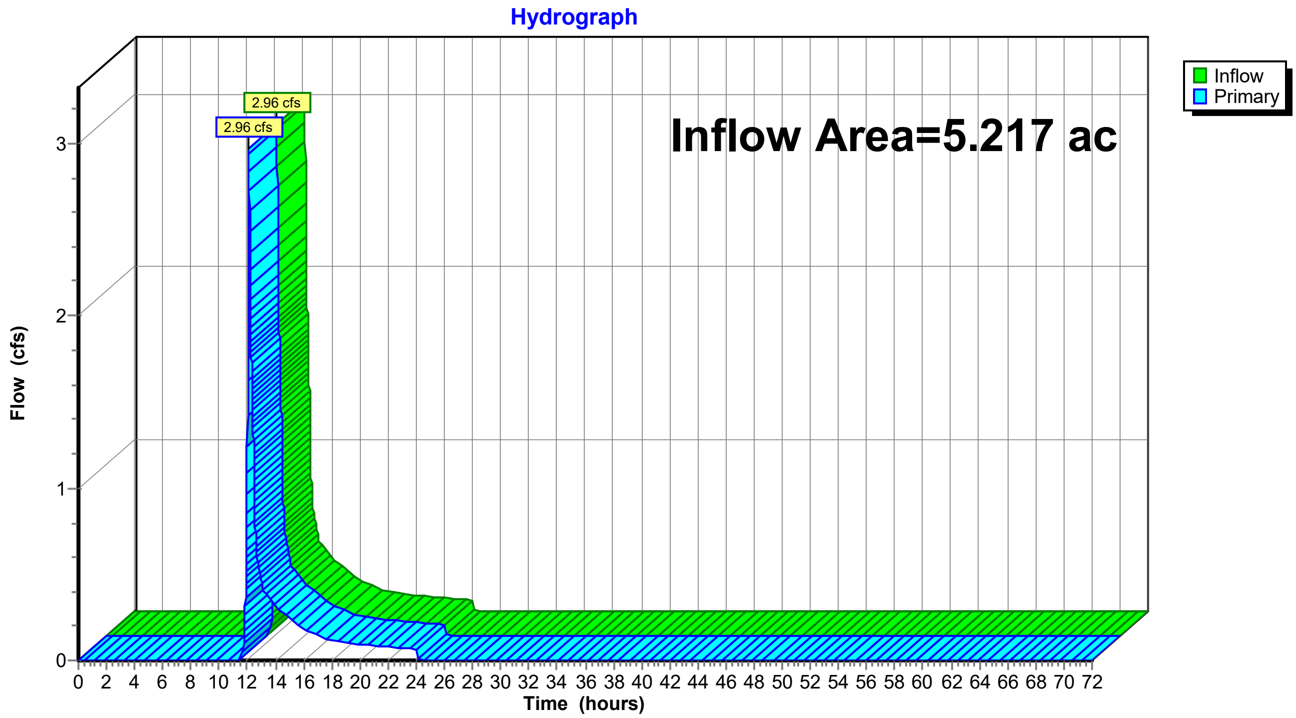


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.217 ac, 38.51% Impervious, Inflow Depth = 0.58" for 1-Year event
Inflow = 2.96 cfs @ 12.10 hrs, Volume= 0.251 af
Primary = 2.96 cfs @ 12.10 hrs, Volume= 0.251 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

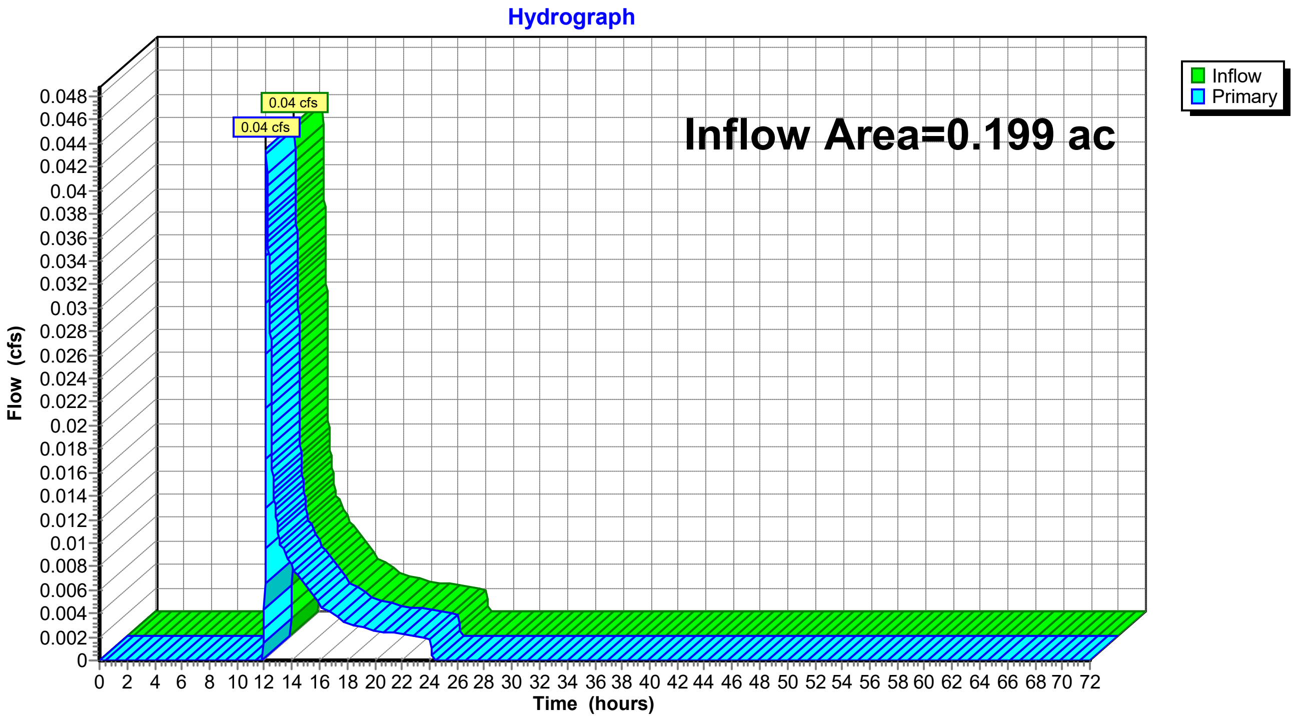


Summary for Link DP-2: Ditch

Inflow Area =	0.199 ac,	39.47% Impervious,	Inflow Depth = 0.33"	for 1-Year event
Inflow =	0.04 cfs @	12.13 hrs, Volume=	0.006 af	
Primary =	0.04 cfs @	12.13 hrs, Volume=	0.006 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=0.88"
Tc=6.0 min CN=71 Runoff=4.93 cfs 0.384 af

Subcatchment 2: Subcatchment 2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=0.56"
Tc=6.0 min CN=64 Runoff=0.10 cfs 0.009 af

Link DP-1: Reservoir and Swimming Area Inflow=4.93 cfs 0.384 af
Primary=4.93 cfs 0.384 af

Link DP-2: Ditch Inflow=0.10 cfs 0.009 af
Primary=0.10 cfs 0.009 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.394 af Average Runoff Depth = 0.87"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

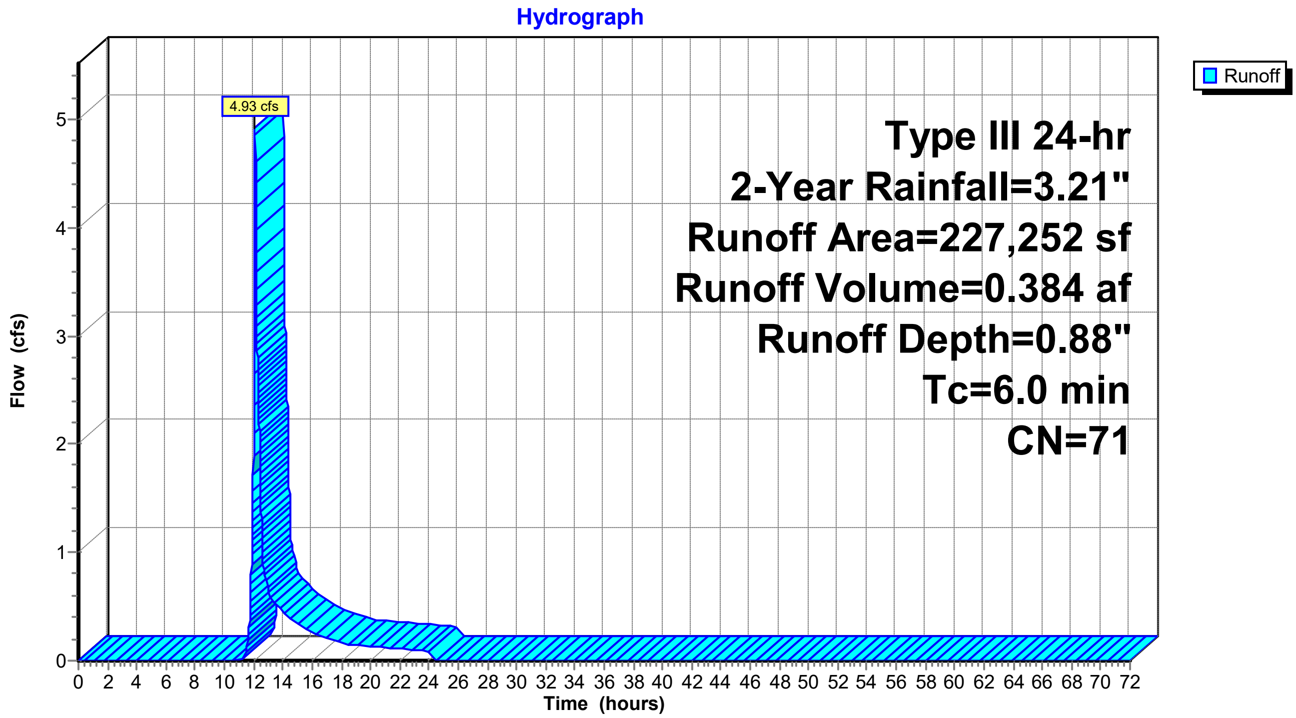
Runoff = 4.93 cfs @ 12.10 hrs, Volume= 0.384 af, Depth= 0.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.21"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

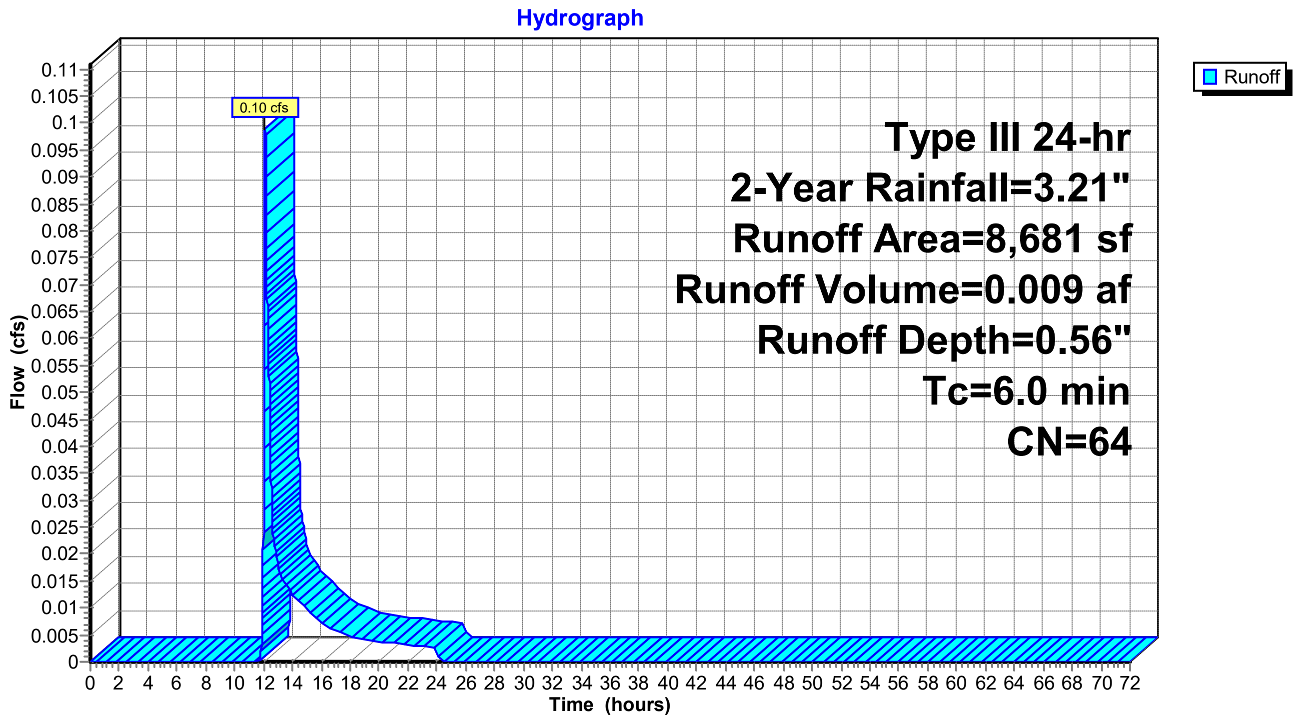
Runoff = 0.10 cfs @ 12.11 hrs, Volume= 0.009 af, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.21"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

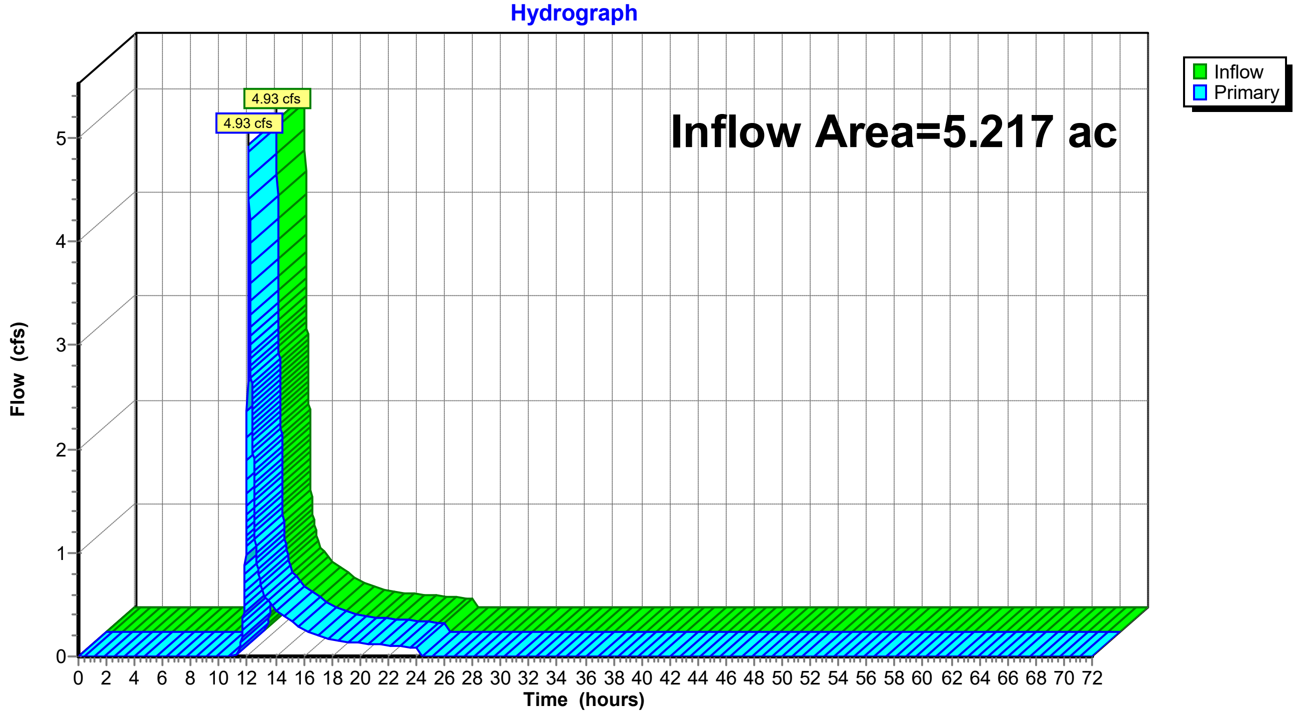


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.217 ac, 38.51% Impervious, Inflow Depth = 0.88" for 2-Year event
Inflow = 4.93 cfs @ 12.10 hrs, Volume= 0.384 af
Primary = 4.93 cfs @ 12.10 hrs, Volume= 0.384 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

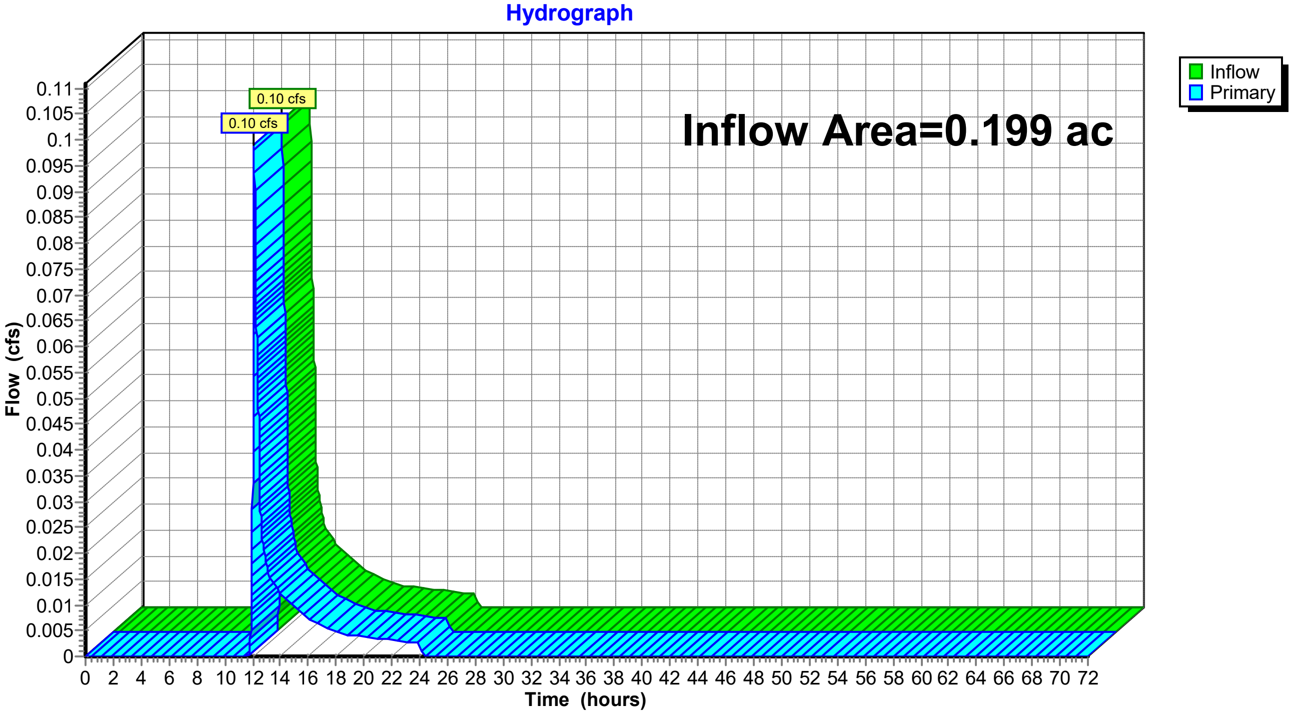


Summary for Link DP-2: Ditch

Inflow Area =	0.199 ac, 39.47% Impervious, Inflow Depth = 0.56"	for 2-Year event	
Inflow =	0.10 cfs @ 12.11 hrs, Volume=	0.009 af	
Primary =	0.10 cfs @ 12.11 hrs, Volume=	0.009 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=2.01"
Tc=6.0 min CN=71 Runoff=12.11 cfs 0.874 af

Subcatchment 2: Subcatchment 2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=1.49"
Tc=6.0 min CN=64 Runoff=0.33 cfs 0.025 af

Link DP-1: Reservoir and Swimming Area Inflow=12.11 cfs 0.874 af
Primary=12.11 cfs 0.874 af

Link DP-2: Ditch Inflow=0.33 cfs 0.025 af
Primary=0.33 cfs 0.025 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.899 af Average Runoff Depth = 1.99"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

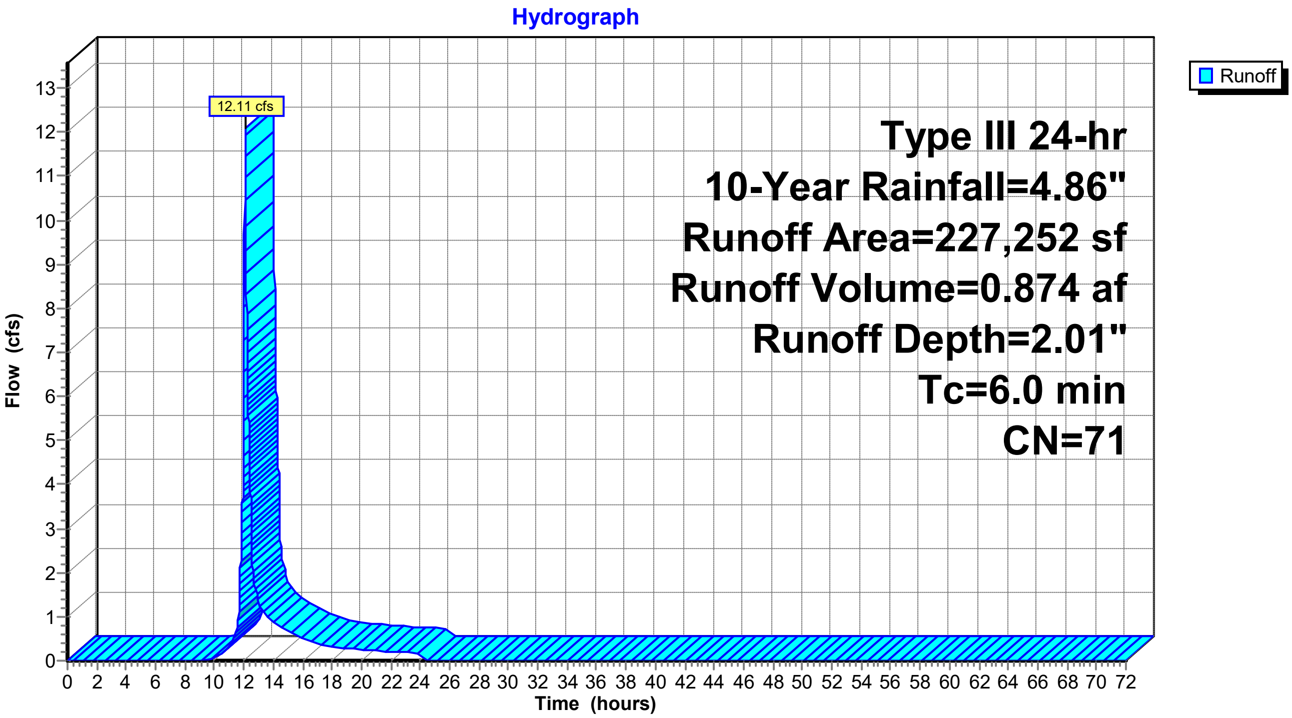
Runoff = 12.11 cfs @ 12.09 hrs, Volume= 0.874 af, Depth= 2.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

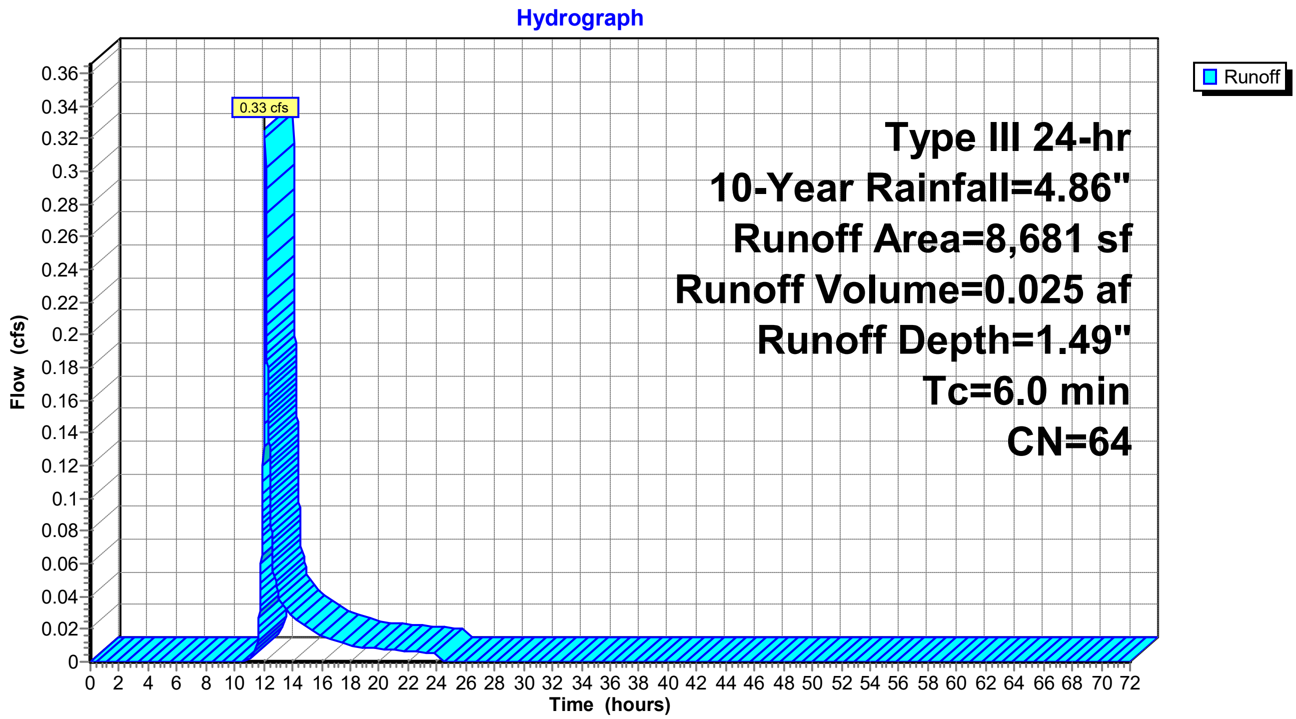
Runoff = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af, Depth= 1.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

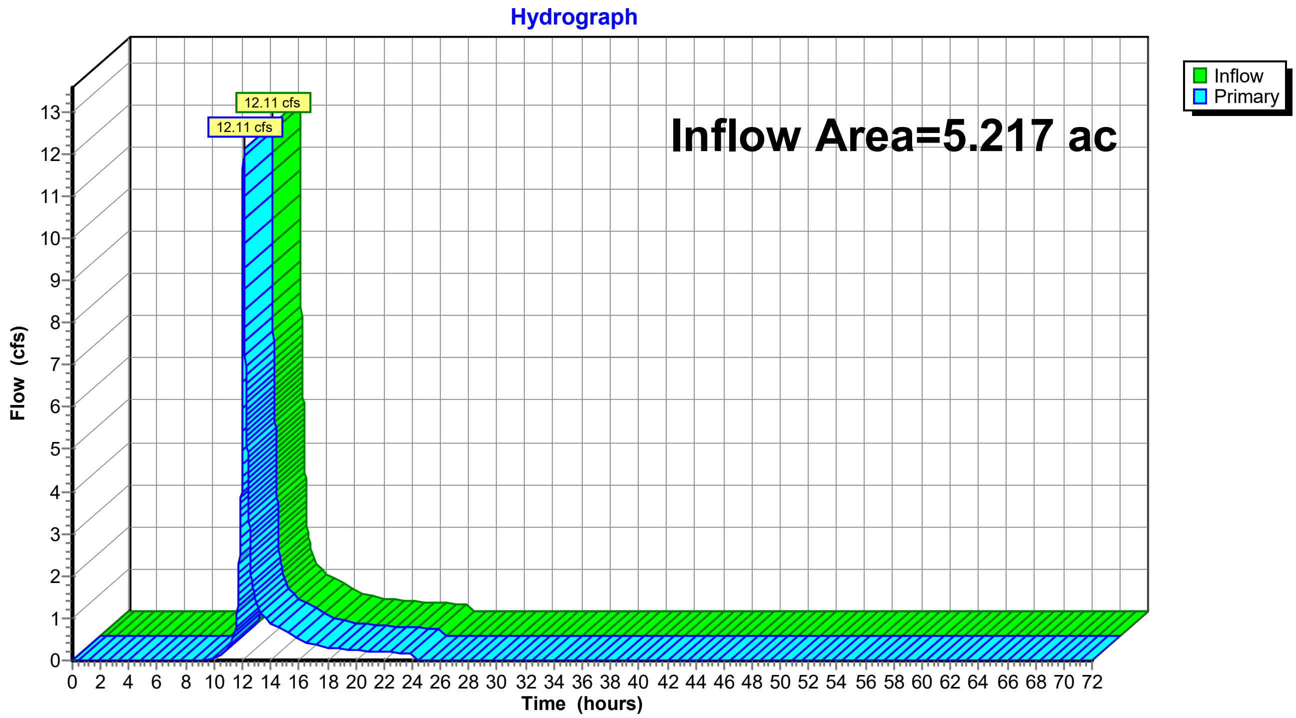


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.217 ac, 38.51% Impervious, Inflow Depth = 2.01" for 10-Year event
Inflow = 12.11 cfs @ 12.09 hrs, Volume= 0.874 af
Primary = 12.11 cfs @ 12.09 hrs, Volume= 0.874 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

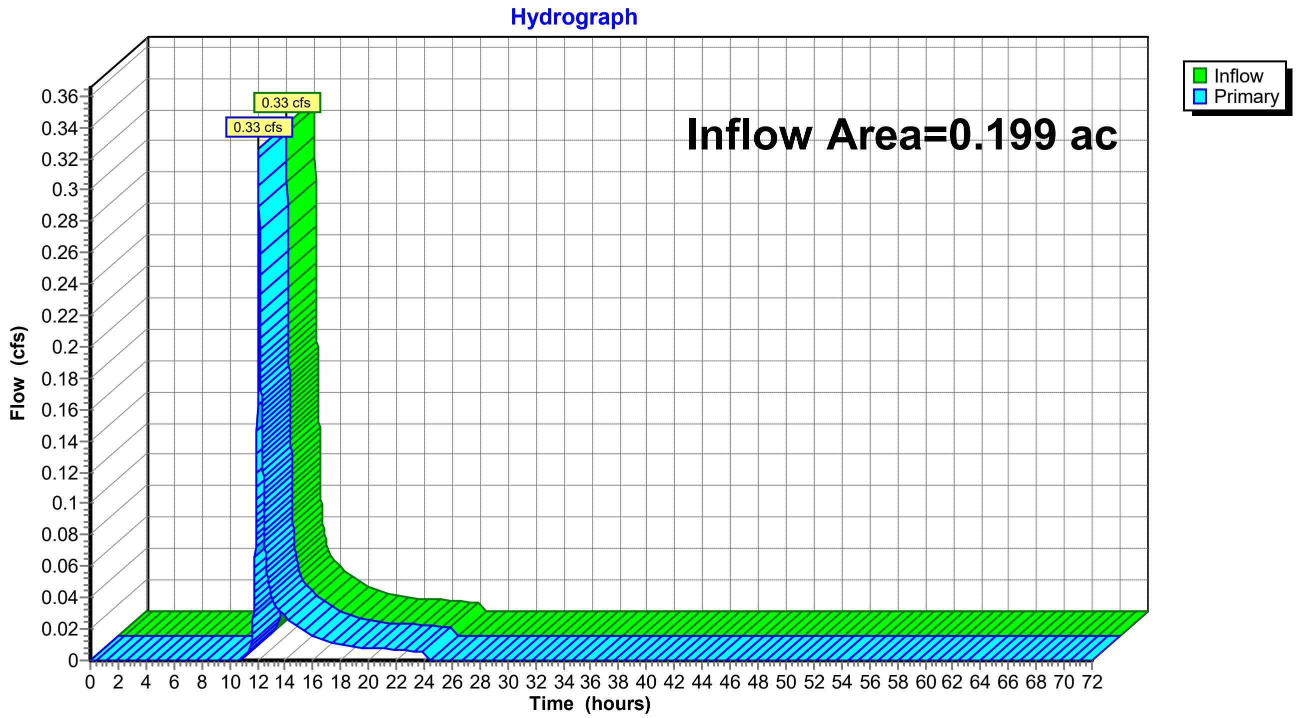


Summary for Link DP-2: Ditch

Inflow Area =	0.199 ac,	39.47% Impervious,	Inflow Depth = 1.49"	for 10-Year event
Inflow =	0.33 cfs @	12.10 hrs, Volume=	0.025 af	
Primary =	0.33 cfs @	12.10 hrs, Volume=	0.025 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=71 Runoff=18.53 cfs 1.320 af

Subcatchment 2: Subcatchment 2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=2.39"
Tc=6.0 min CN=64 Runoff=0.54 cfs 0.040 af

Link DP-1: Reservoir and Swimming Area Inflow=18.53 cfs 1.320 af
Primary=18.53 cfs 1.320 af

Link DP-2: Ditch Inflow=0.54 cfs 0.040 af
Primary=0.54 cfs 0.040 af

Total Runoff Area = 5.416 ac Runoff Volume = 1.360 af Average Runoff Depth = 3.01"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

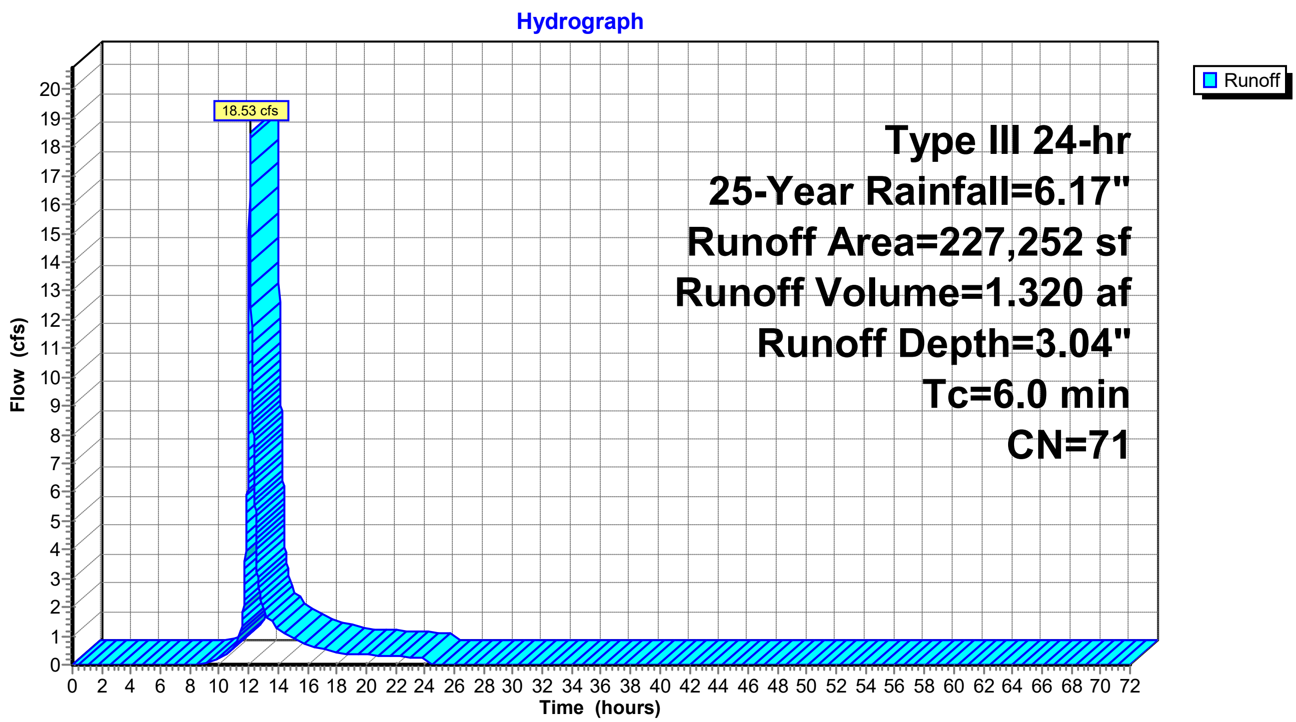
Runoff = 18.53 cfs @ 12.09 hrs, Volume= 1.320 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.17"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

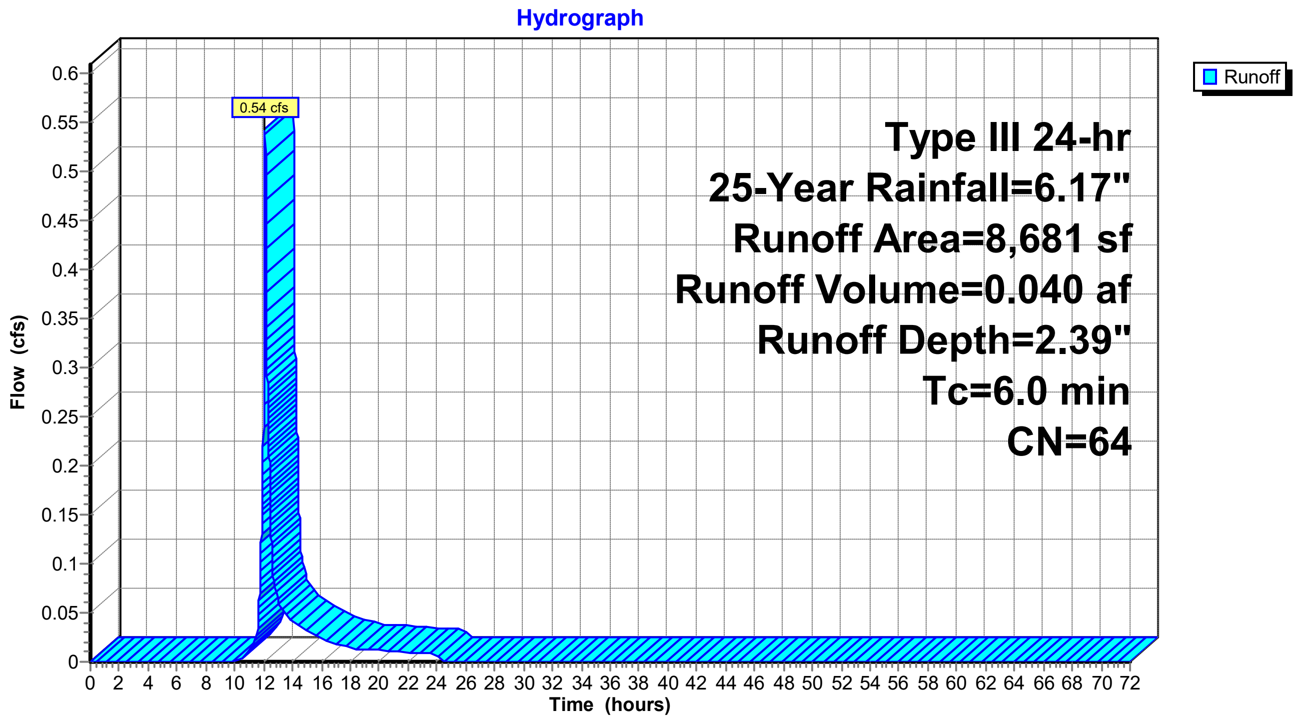
Runoff = 0.54 cfs @ 12.09 hrs, Volume= 0.040 af, Depth= 2.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.17"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

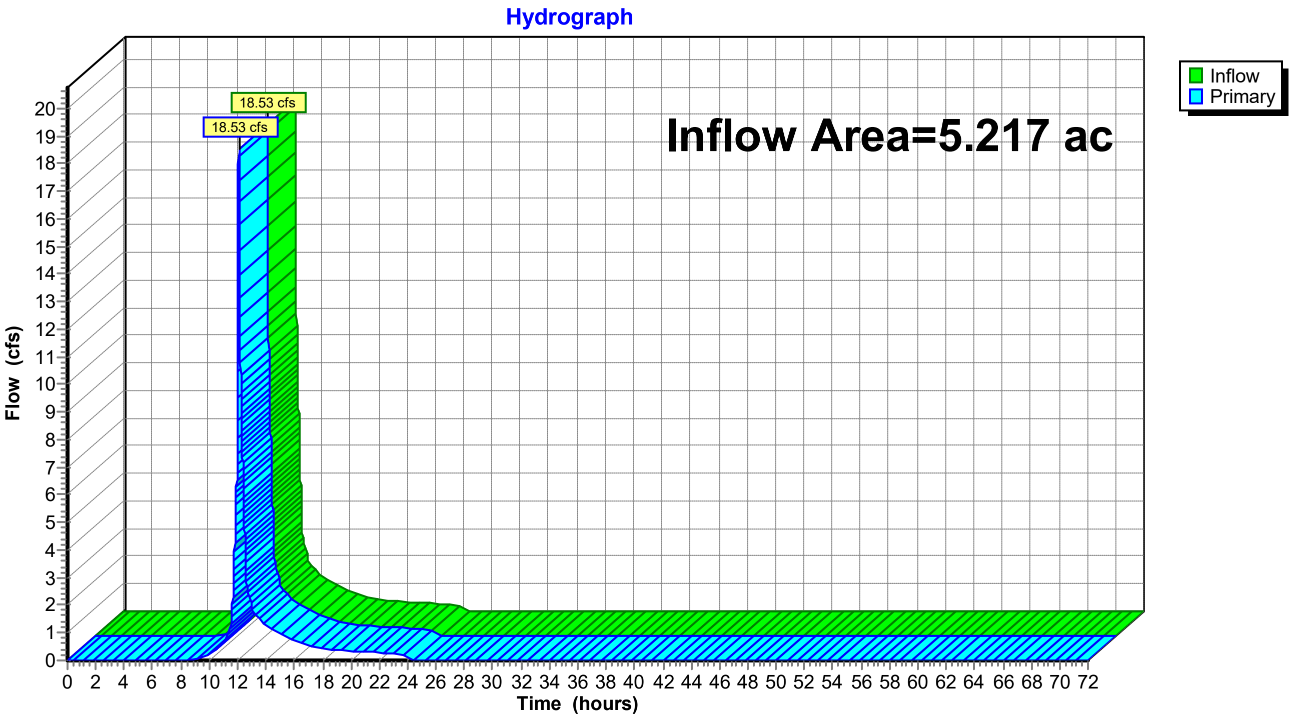


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.217 ac, 38.51% Impervious,	Inflow Depth = 3.04"	for 25-Year event	
Inflow =	18.53 cfs @ 12.09 hrs,	Volume=	1.320 af	
Primary =	18.53 cfs @ 12.09 hrs,	Volume=	1.320 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

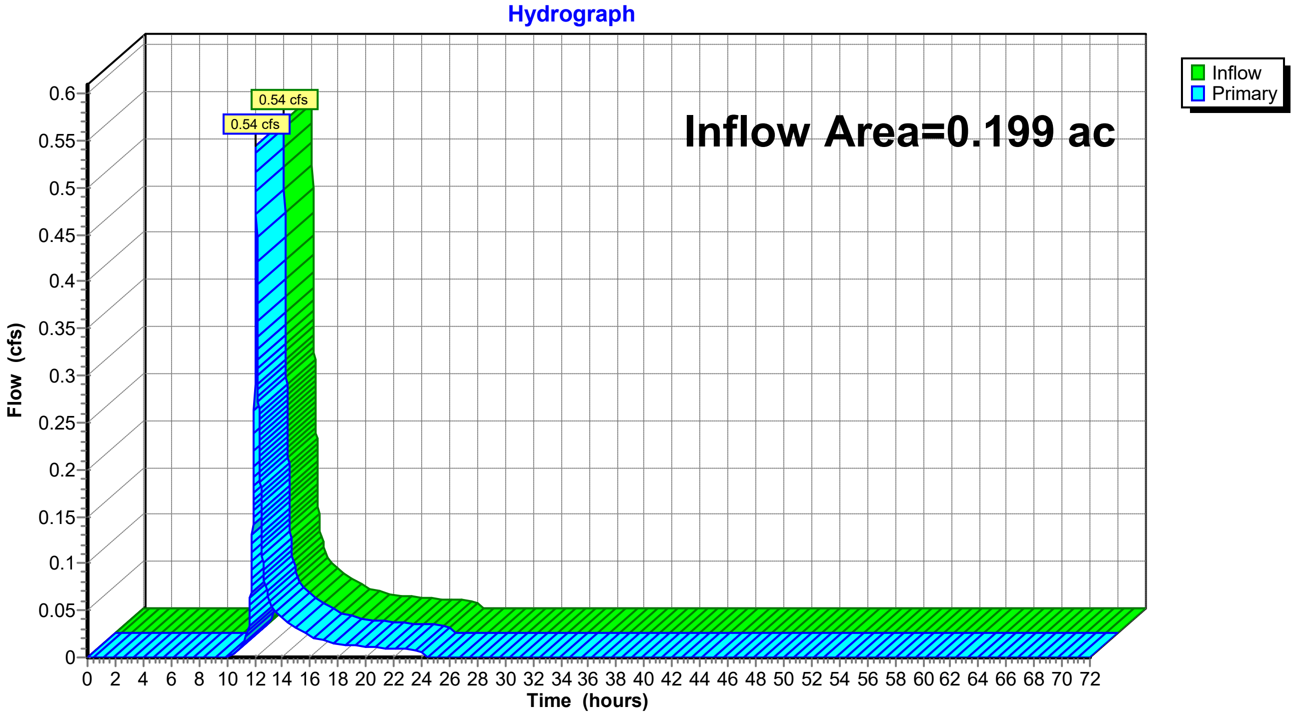


Summary for Link DP-2: Ditch

Inflow Area = 0.199 ac, 39.47% Impervious, Inflow Depth = 2.39" for 25-Year event
Inflow = 0.54 cfs @ 12.09 hrs, Volume= 0.040 af
Primary = 0.54 cfs @ 12.09 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1: Subcatchment 1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=5.33"
Tc=6.0 min CN=71 Runoff=32.53 cfs 2.315 af

Subcatchment 2: Subcatchment 2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=4.47"
Tc=6.0 min CN=64 Runoff=1.04 cfs 0.074 af

Link DP-1: Reservoir and Swimming Area Inflow=32.53 cfs 2.315 af
Primary=32.53 cfs 2.315 af

Link DP-2: Ditch Inflow=1.04 cfs 0.074 af
Primary=1.04 cfs 0.074 af

Total Runoff Area = 5.416 ac Runoff Volume = 2.389 af Average Runoff Depth = 5.29"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

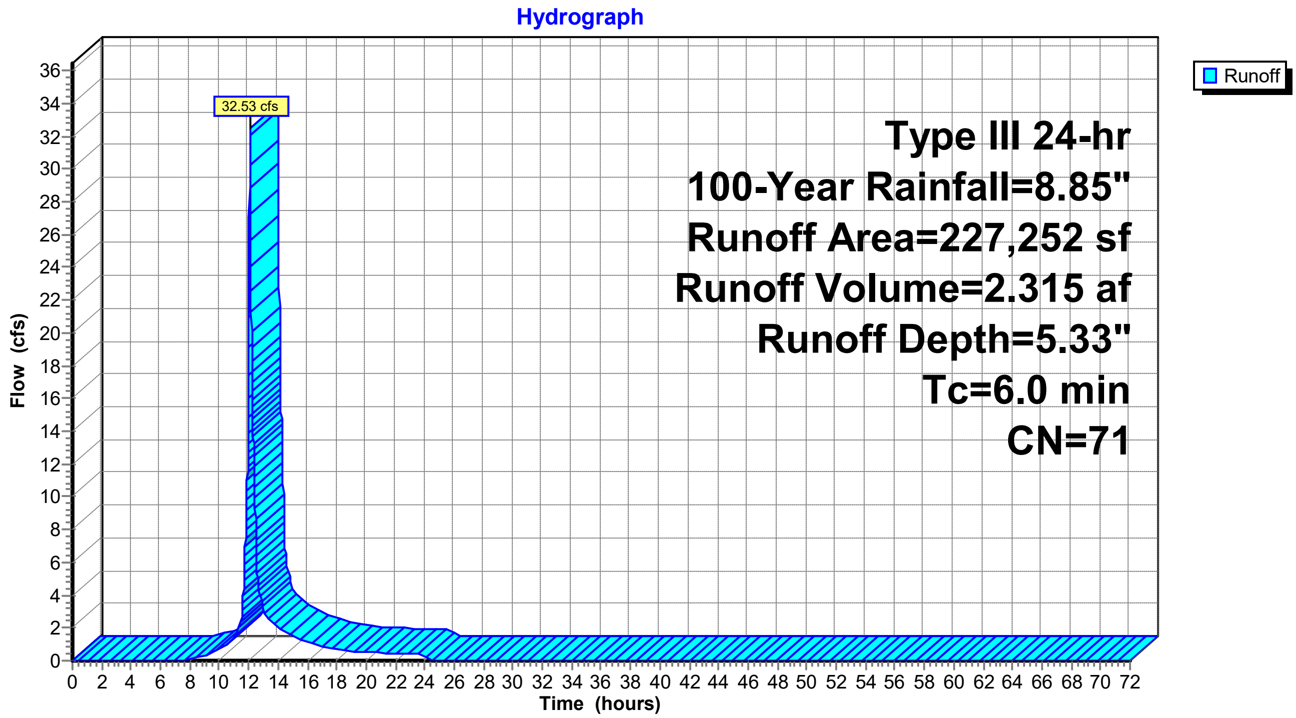
Runoff = 32.53 cfs @ 12.09 hrs, Volume= 2.315 af, Depth= 5.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.85"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

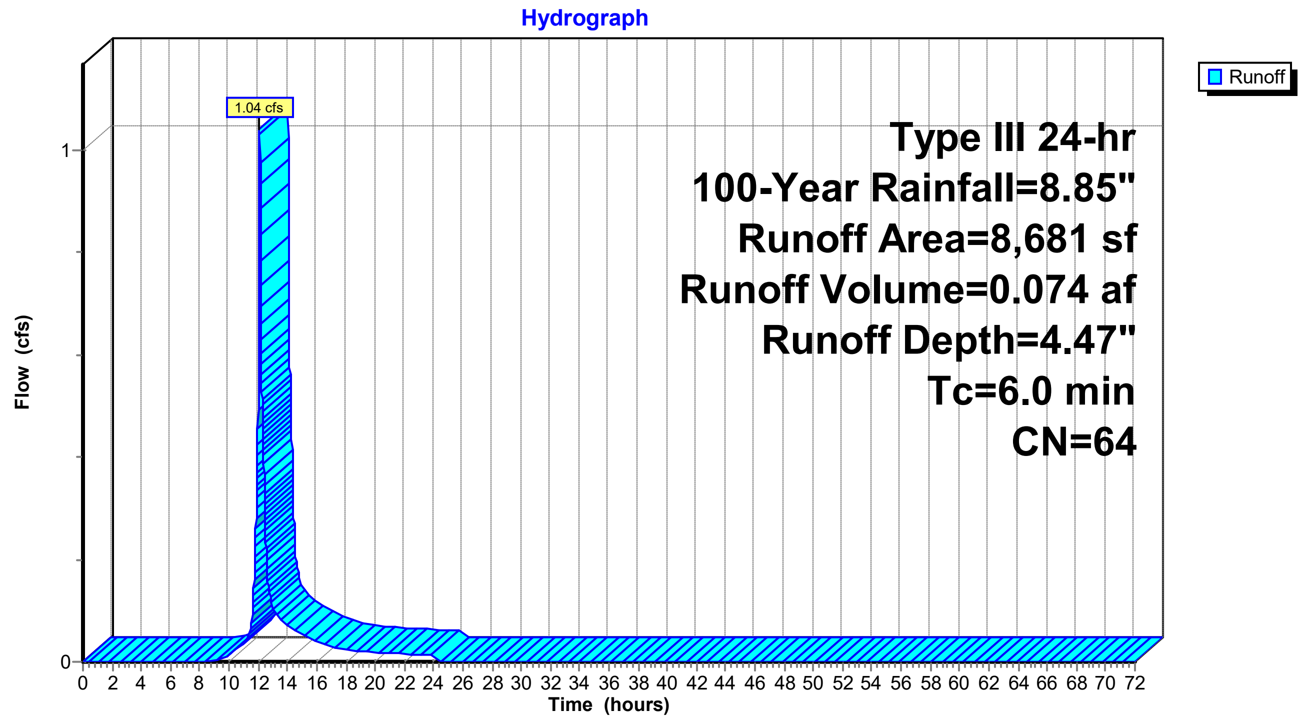
Runoff = 1.04 cfs @ 12.09 hrs, Volume= 0.074 af, Depth= 4.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.85"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

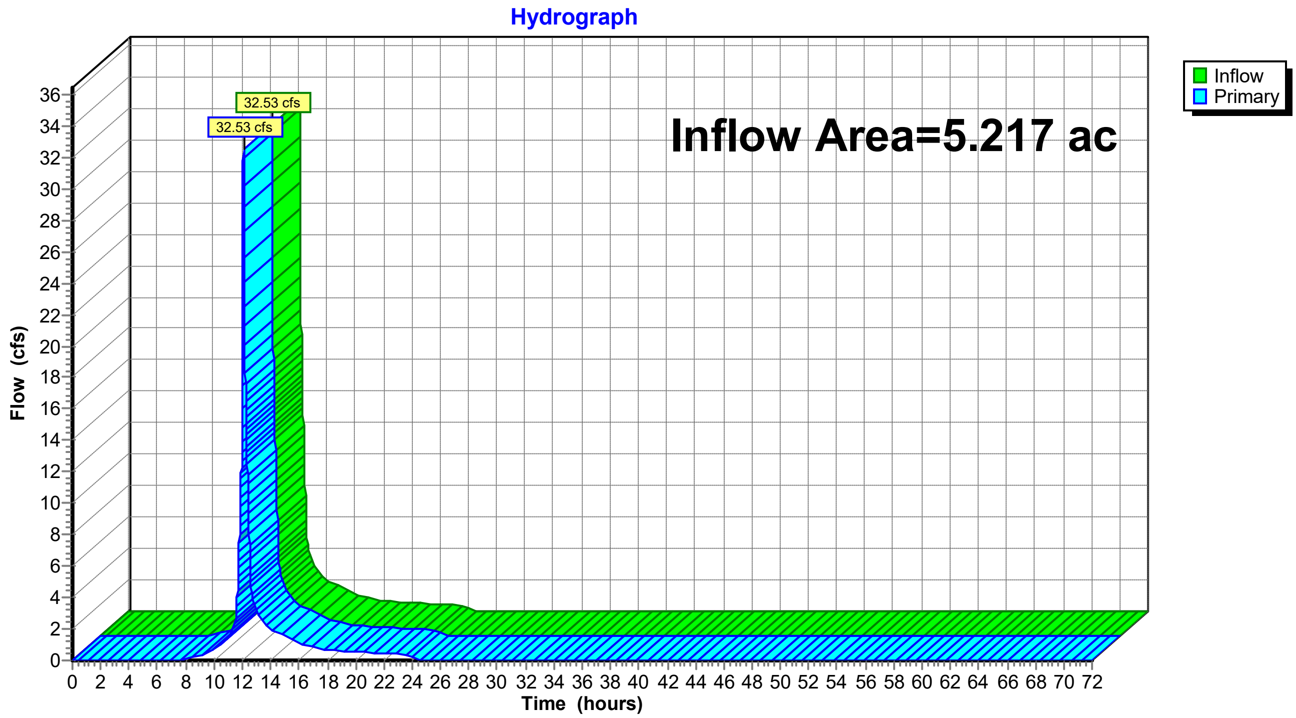


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.217 ac, 38.51% Impervious, Inflow Depth = 5.33" for 100-Year event
Inflow = 32.53 cfs @ 12.09 hrs, Volume= 2.315 af
Primary = 32.53 cfs @ 12.09 hrs, Volume= 2.315 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

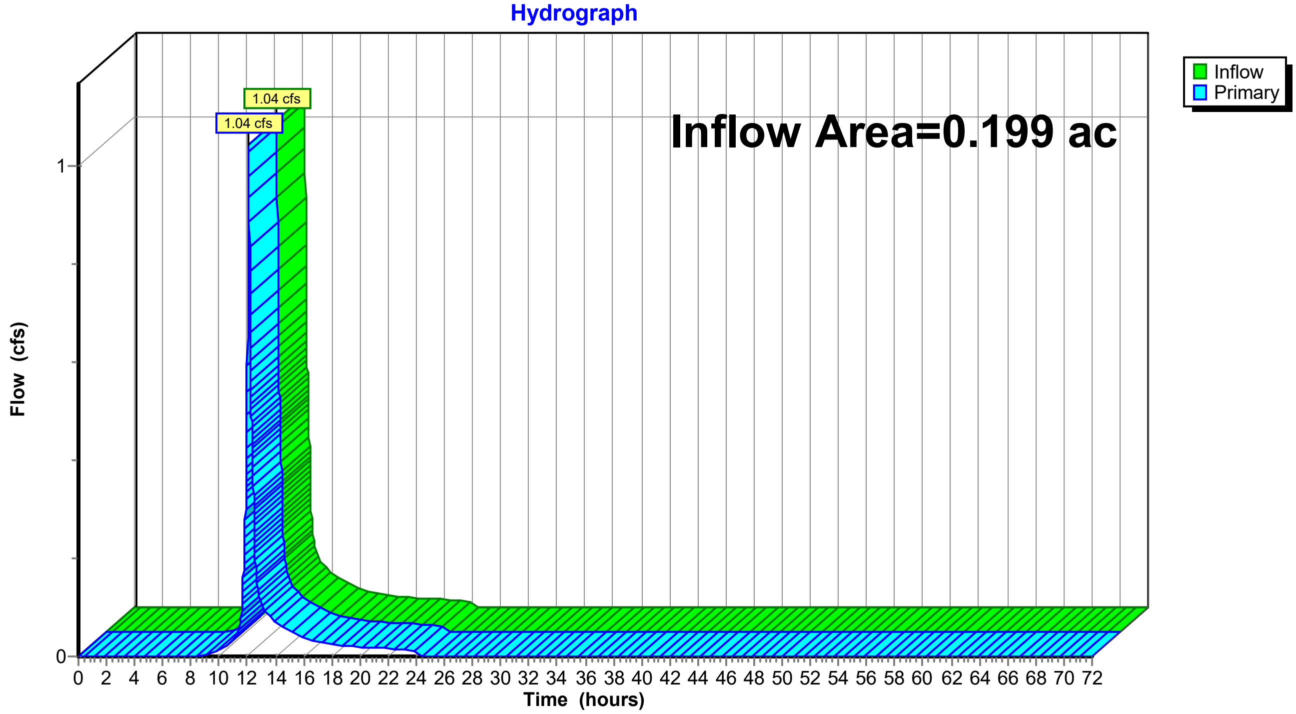


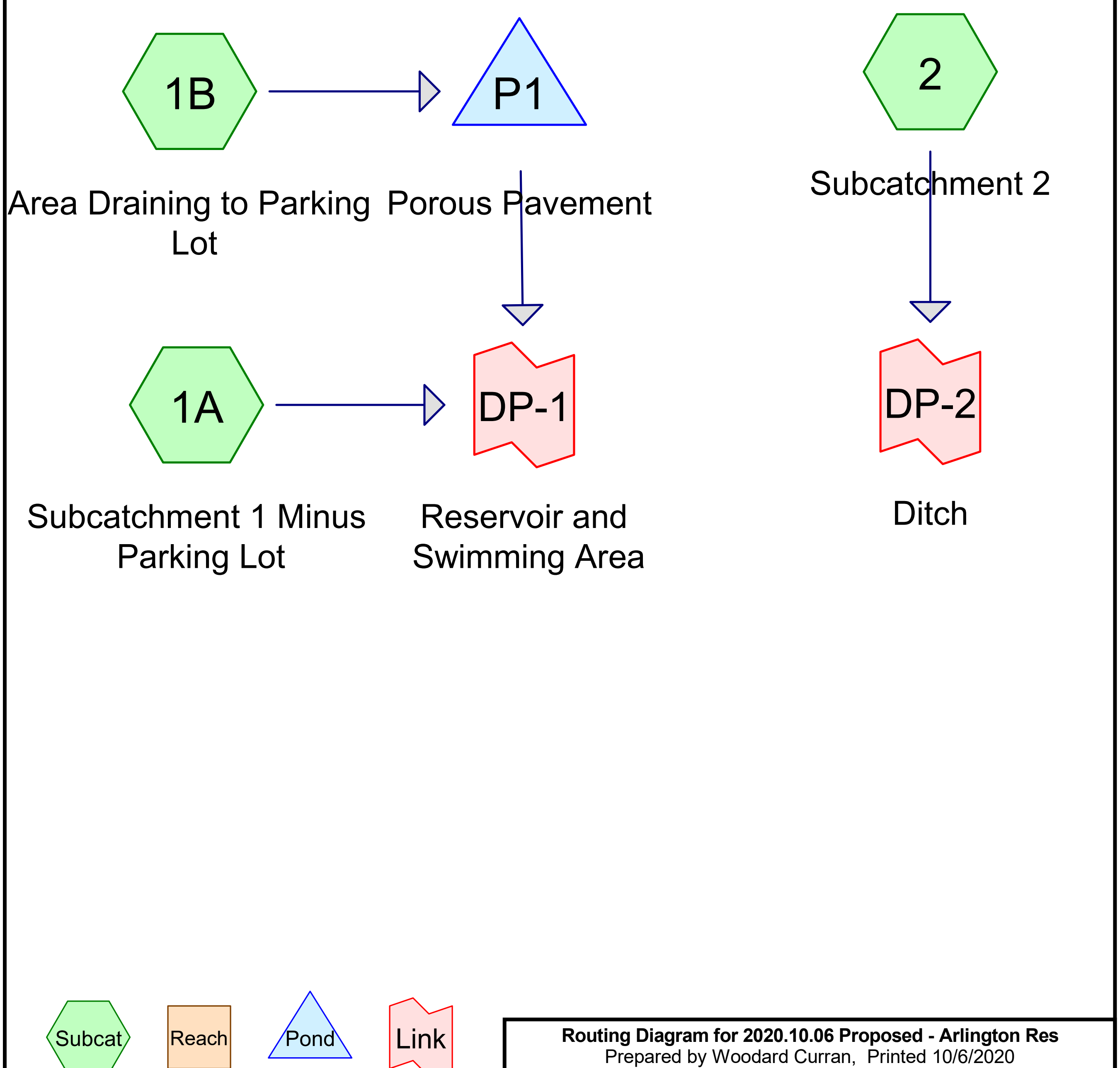
Summary for Link DP-2: Ditch

Inflow Area =	0.199 ac, 39.47% Impervious, Inflow Depth = 4.47"	for 100-Year event		
Inflow =	1.04 cfs @	12.09 hrs, Volume=	0.074 af	
Primary =	1.04 cfs @	12.09 hrs, Volume=	0.074 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch





Routing Diagram for 2020.10.06 Proposed - Arlington Res
Prepared by Woodard Curran, Printed 10/6/2020
HydroCAD® 10.00-21 s/n 01204 © 2018 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.573	39	>75% Grass cover, Good, HSG A (1A, 1B, 2)
1.029	63	Beach Sand, HSG A (1A)
0.304	30	Brush, Good, HSG A (1A)
0.467	98	Impervious Surface, HSG A (1A, 1B)
0.184	39	Permeable Playground Surface, Good, HSG A (1A)
0.521	98	Porous Pavement, HSG A (1A, 1B)
0.138	96	Stone Dust, HSG A (1A)
1.200	98	Water Surface, HSG A (1A)
5.416	**68**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.416	HSG A	1A, 1B, 2
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
5.416		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatch Numbers
1.573	0.000	0.000	0.000	0.000	1.573	>75% Grass cover, Good	
1.029	0.000	0.000	0.000	0.000	1.029	Beach Sand	
0.304	0.000	0.000	0.000	0.000	0.304	Brush, Good	
0.467	0.000	0.000	0.000	0.000	0.467	Impervious Surface	
0.184	0.000	0.000	0.000	0.000	0.184	Permeable Playground Surface, Good	
0.521	0.000	0.000	0.000	0.000	0.521	Porous Pavement	
0.138	0.000	0.000	0.000	0.000	0.138	Stone Dust	
1.200	0.000	0.000	0.000	0.000	1.200	Water Surface	
5.416	**0.000**	**0.000**	**0.000**	**0.000**	**5.416**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	P1	162.15	162.05	20.0	0.0050	0.013	12.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A: Subcatchment 1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=0.43"
Tc=6.0 min CN=67 Runoff=1.65 cfs 0.166 af

Subcatchment 1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=1.07"
Tc=6.0 min CN=81 Runoff=0.84 cfs 0.061 af

Subcatchment 2: Subcatchment 2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Pond P1: Porous Pavement Peak Elev=161.40' Storage=0 cf Inflow=0.84 cfs 0.061 af
Discarded=0.84 cfs 0.061 af Primary=0.00 cfs 0.000 af Outflow=0.84 cfs 0.061 af

Link DP-1: Reservoir and Swimming Area Inflow=1.65 cfs 0.166 af
Primary=1.65 cfs 0.166 af

Link DP-2: Ditch Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.227 af Average Runoff Depth = 0.50"
59.60% Pervious = 3.228 ac 40.40% Impervious = 2.188 ac

Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

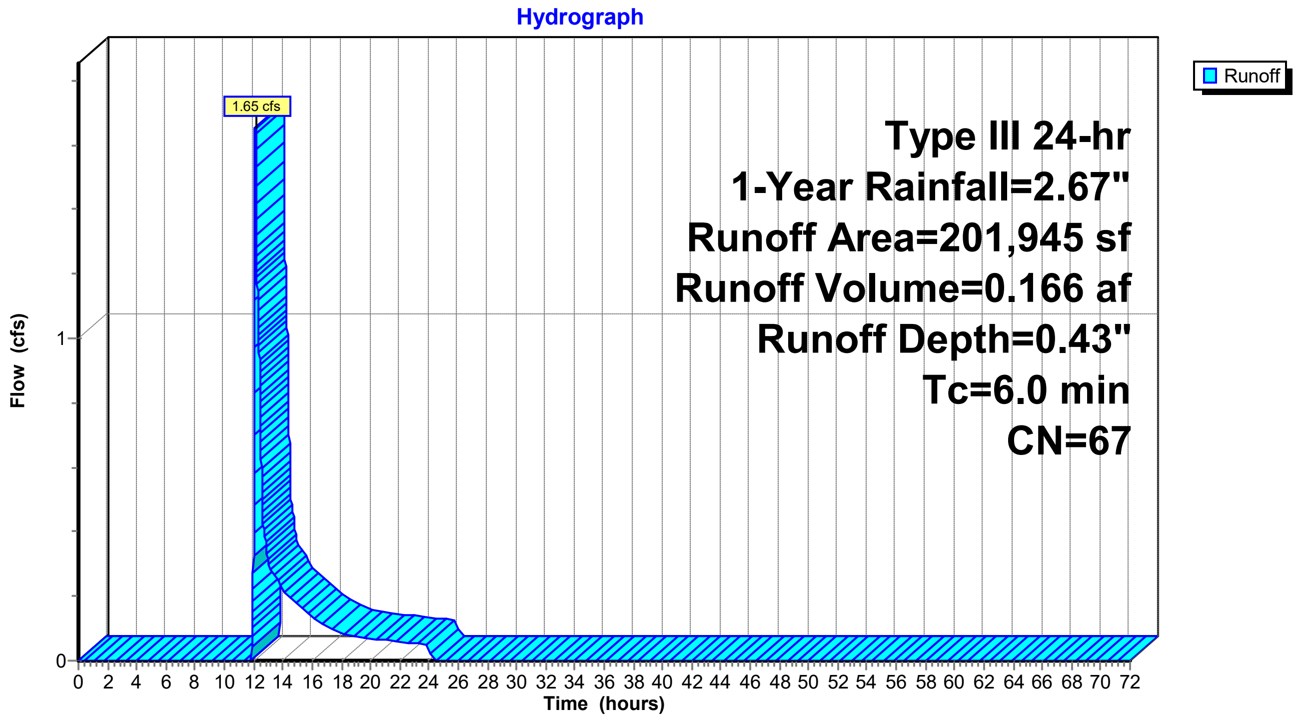
Runoff = 1.65 cfs @ 12.11 hrs, Volume= 0.166 af, Depth= 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.67"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

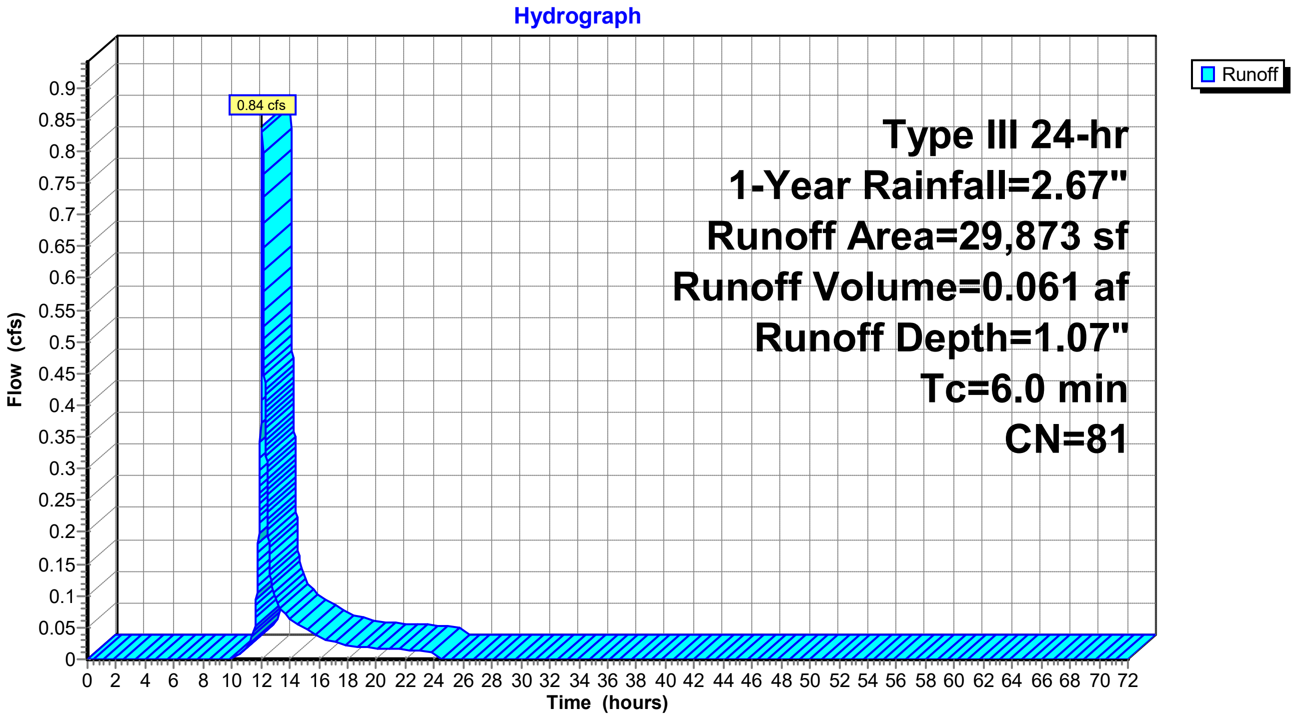
Runoff = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.67"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

[45] Hint: Runoff=Zero

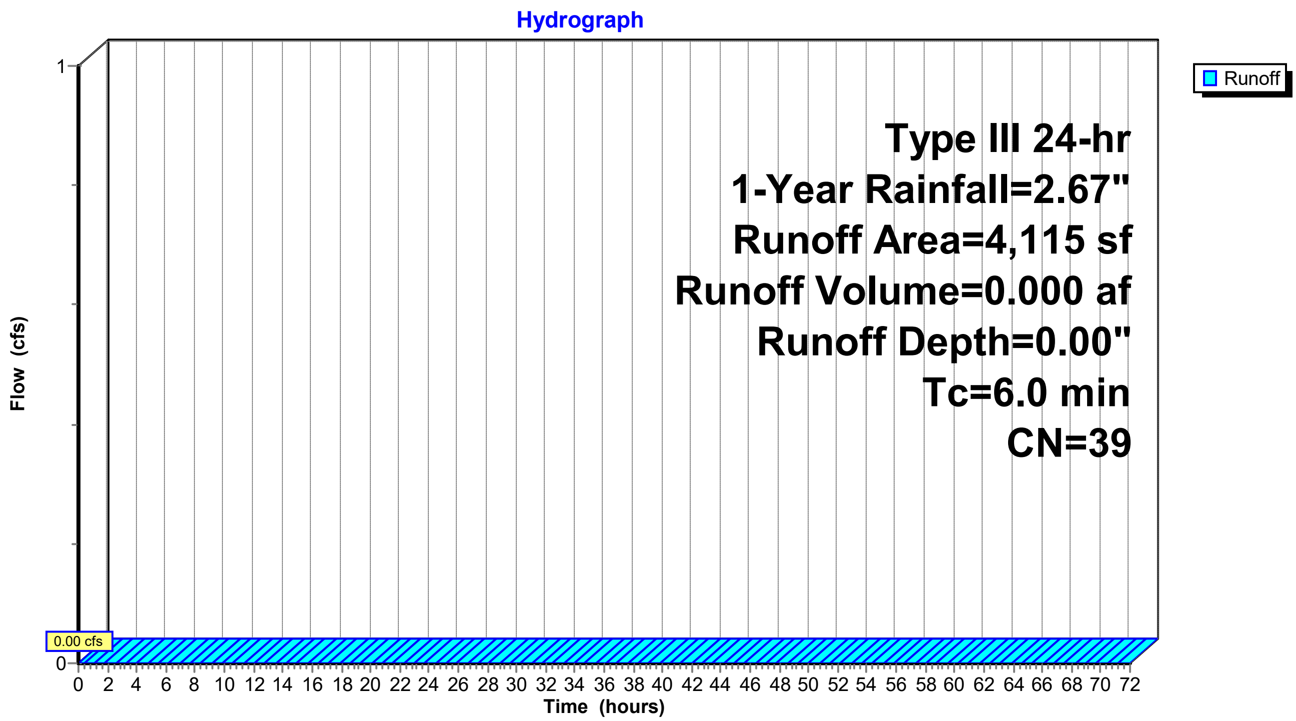
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-Year Rainfall=2.67"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 1.07" for 1-Year event
Inflow = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af
Outflow = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.84 cfs @ 12.09 hrs, Volume= 0.061 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.40' @ 12.09 hrs Surf.Area= 21,411 sf Storage= 0 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (849.0 - 849.0)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

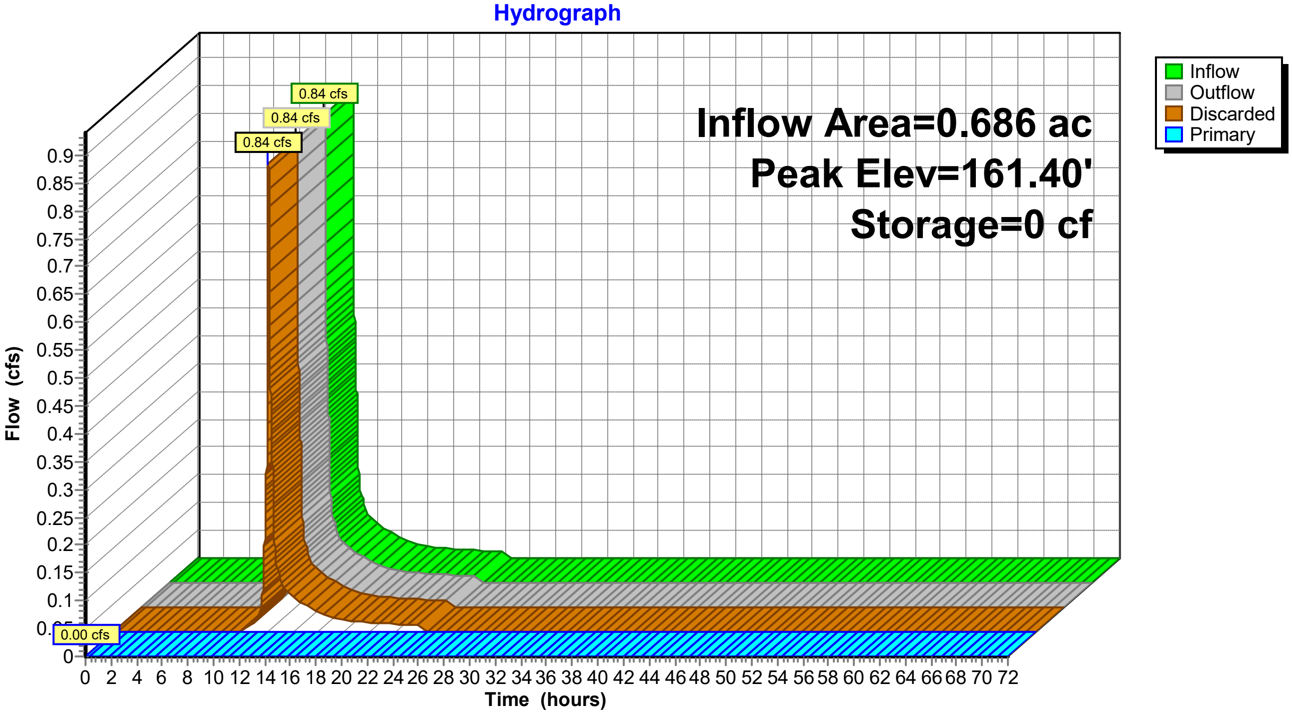
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.09 hrs HW=161.40' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

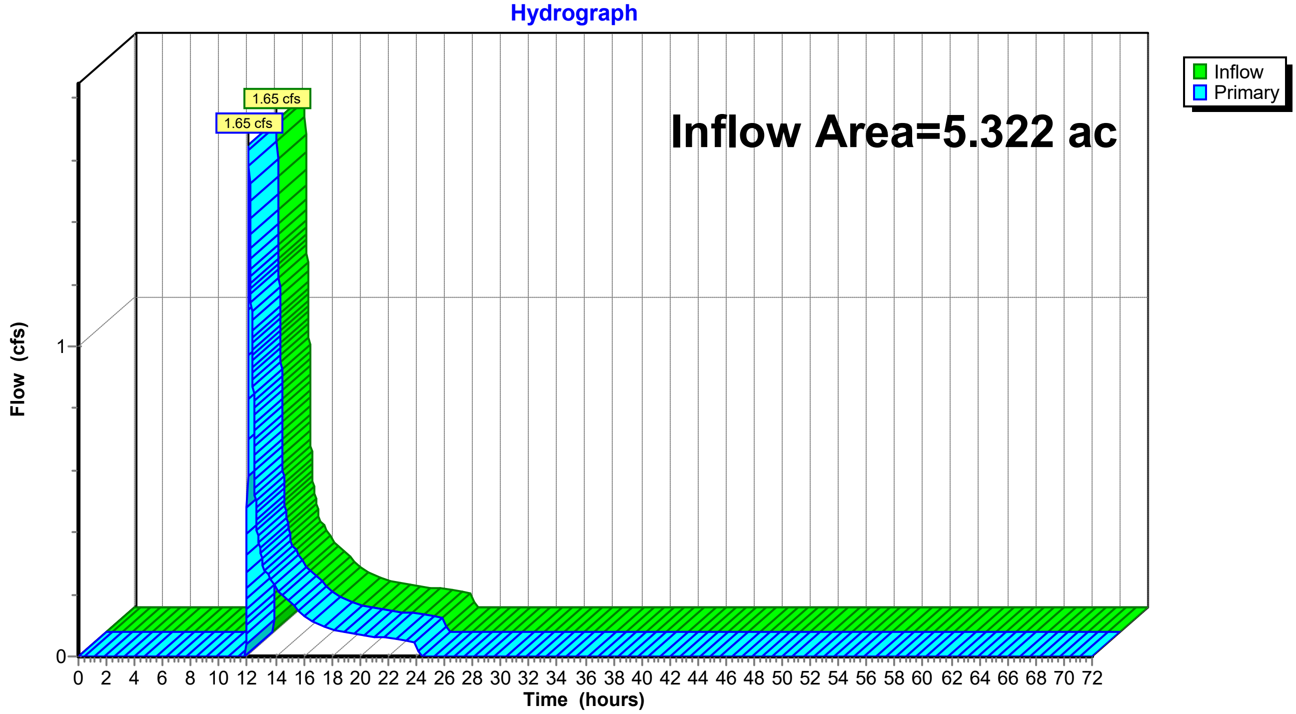


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.322 ac, 41.12% Impervious, Inflow Depth = 0.37"	for 1-Year event	
Inflow =	1.65 cfs @ 12.11 hrs, Volume=	0.166 af	
Primary =	1.65 cfs @ 12.11 hrs, Volume=	0.166 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

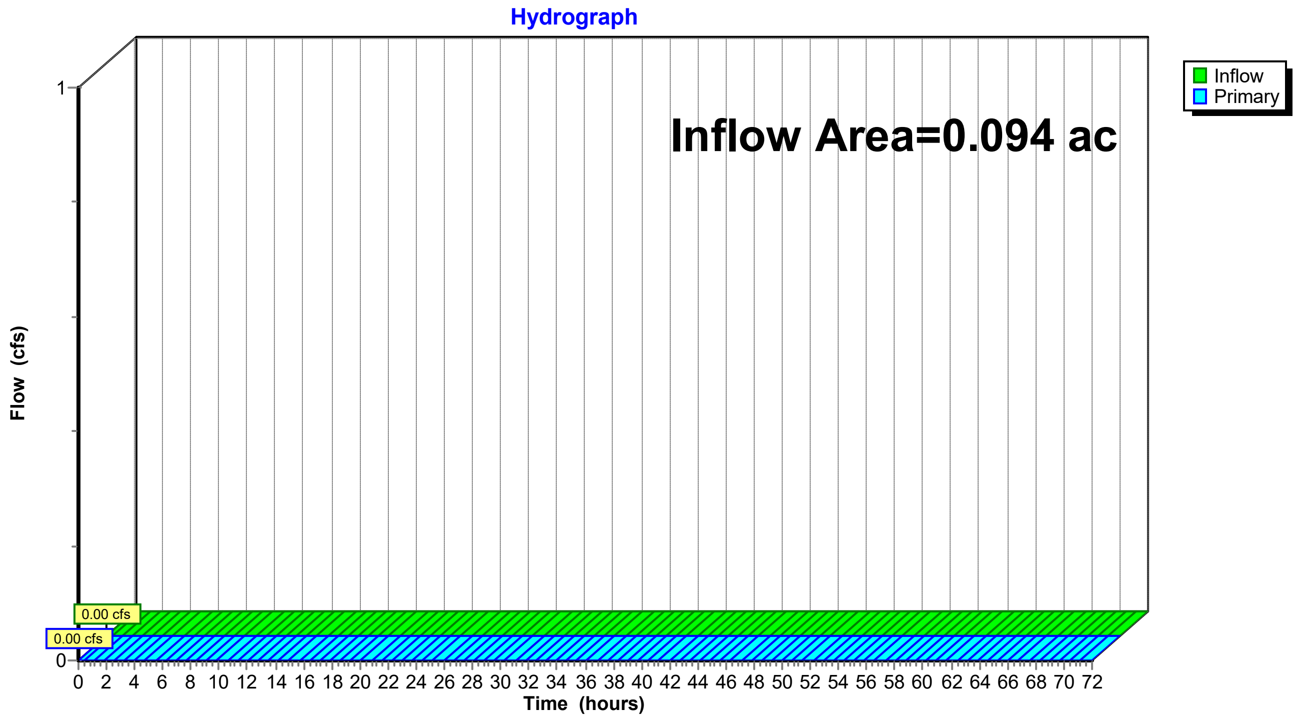


Summary for Link DP-2: Ditch

Inflow Area =	0.094 ac,	0.00% Impervious, Inflow Depth = 0.00"		for 1-Year event
Inflow =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A: Subcatchment 1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=0.69"
Tc=6.0 min CN=67 Runoff=3.15 cfs 0.267 af

Subcatchment 1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=1.48"
Tc=6.0 min CN=81 Runoff=1.18 cfs 0.084 af

Subcatchment 2: Subcatchment 2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Pond P1: Porous Pavement Peak Elev=161.40' Storage=1 cf Inflow=1.18 cfs 0.084 af
Discarded=1.17 cfs 0.084 af Primary=0.00 cfs 0.000 af Outflow=1.17 cfs 0.084 af

Link DP-1: Reservoir and Swimming Area Inflow=3.15 cfs 0.267 af
Primary=3.15 cfs 0.267 af

Link DP-2: Ditch Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.352 af Average Runoff Depth = 0.78"
59.60% Pervious = 3.228 ac 40.40% Impervious = 2.188 ac

Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

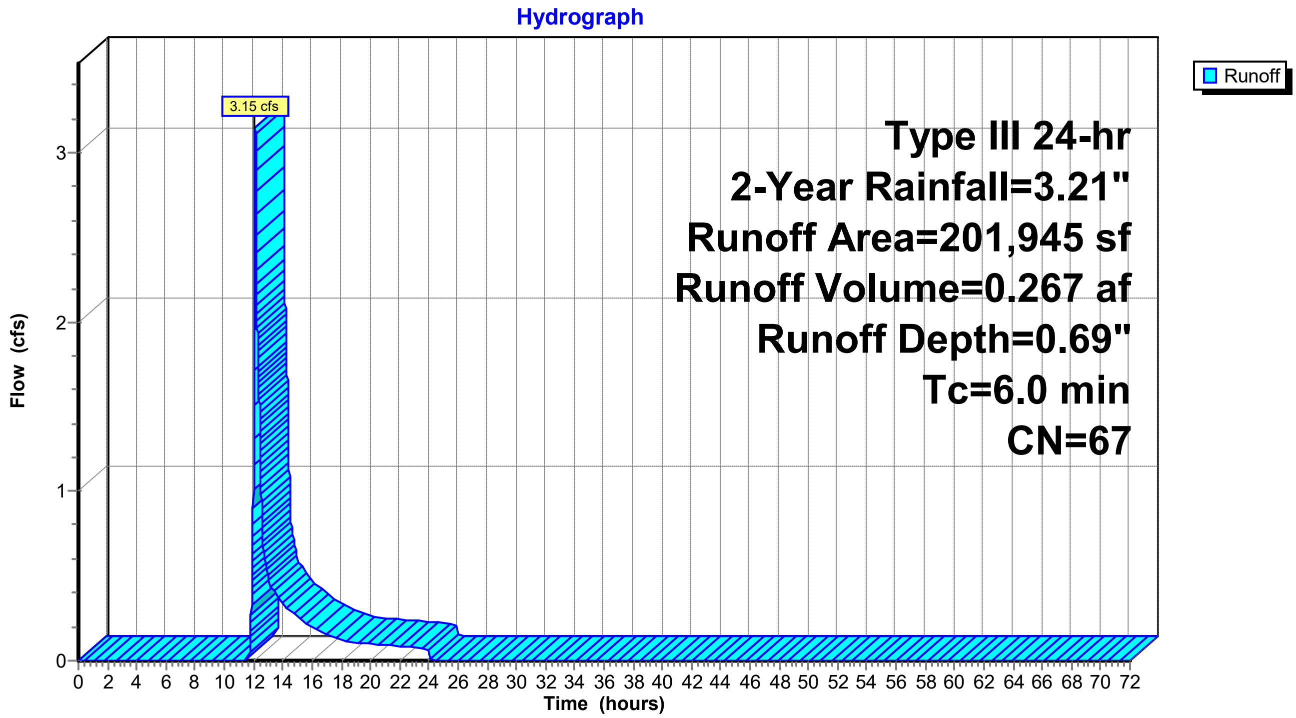
Runoff = 3.15 cfs @ 12.10 hrs, Volume= 0.267 af, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.21"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

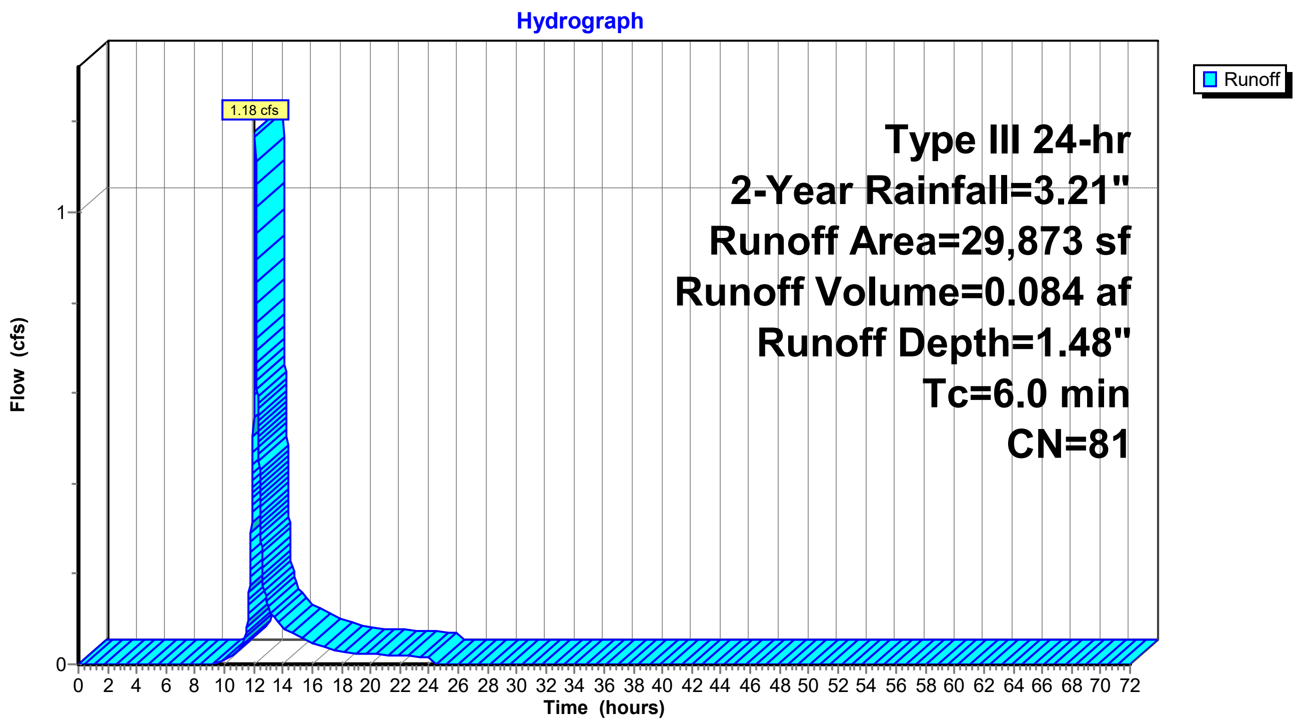
Runoff = 1.18 cfs @ 12.09 hrs, Volume= 0.084 af, Depth= 1.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.21"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

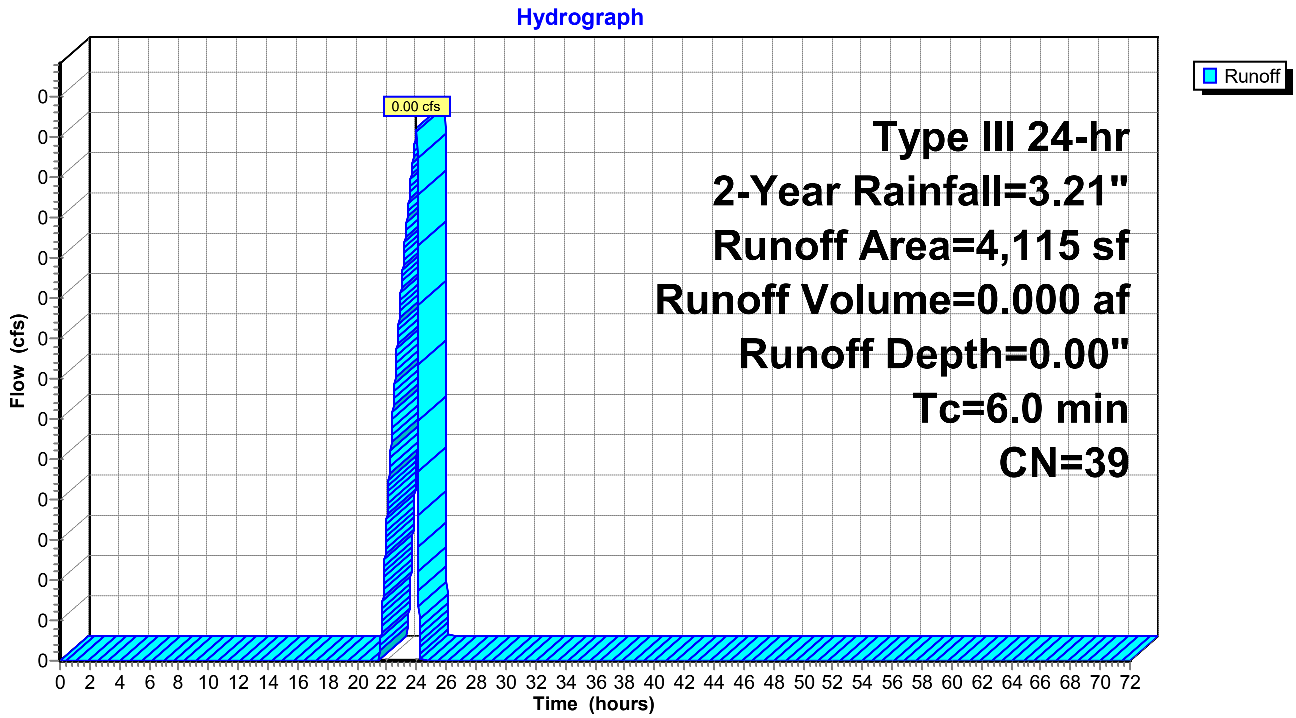
Runoff = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.21"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=547)

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 1.48" for 2-Year event
Inflow = 1.18 cfs @ 12.09 hrs, Volume= 0.084 af
Outflow = 1.17 cfs @ 12.10 hrs, Volume= 0.084 af, Atten= 0%, Lag= 0.4 min
Discarded = 1.17 cfs @ 12.10 hrs, Volume= 0.084 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.40' @ 12.10 hrs Surf.Area= 21,411 sf Storage= 1 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (839.4 - 839.4)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

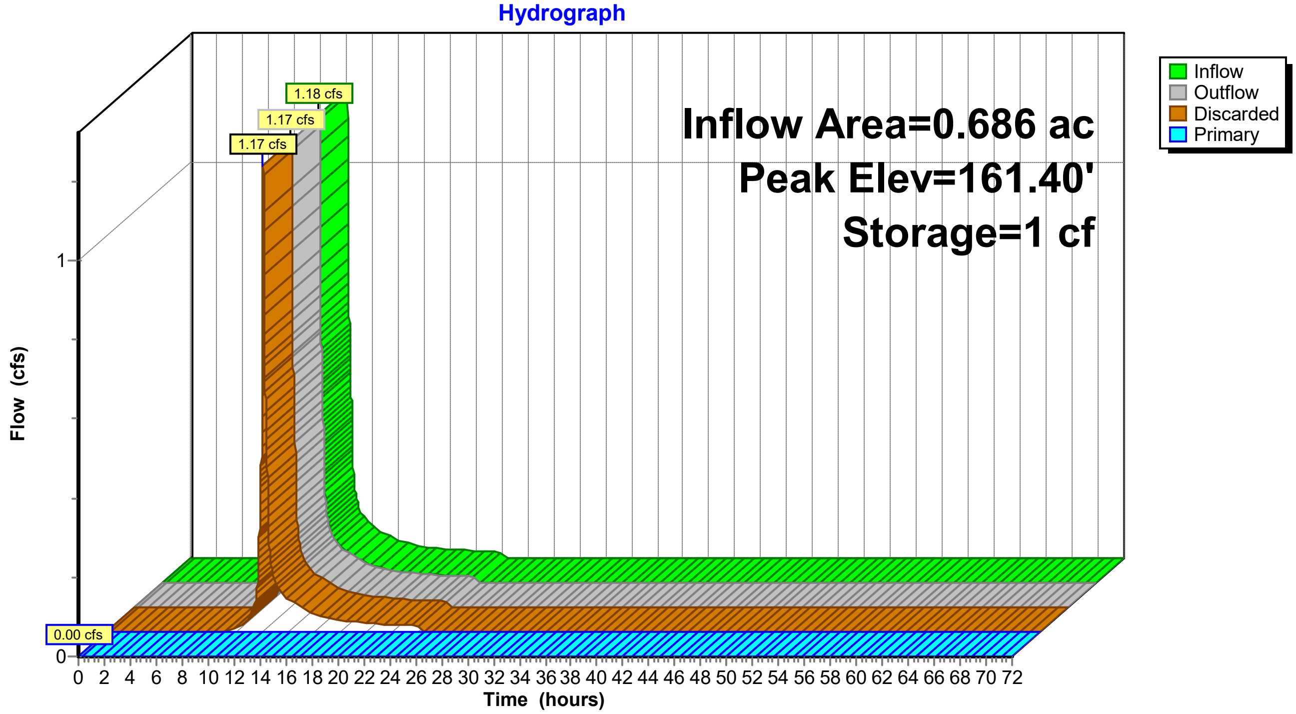
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.10 hrs HW=161.40' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

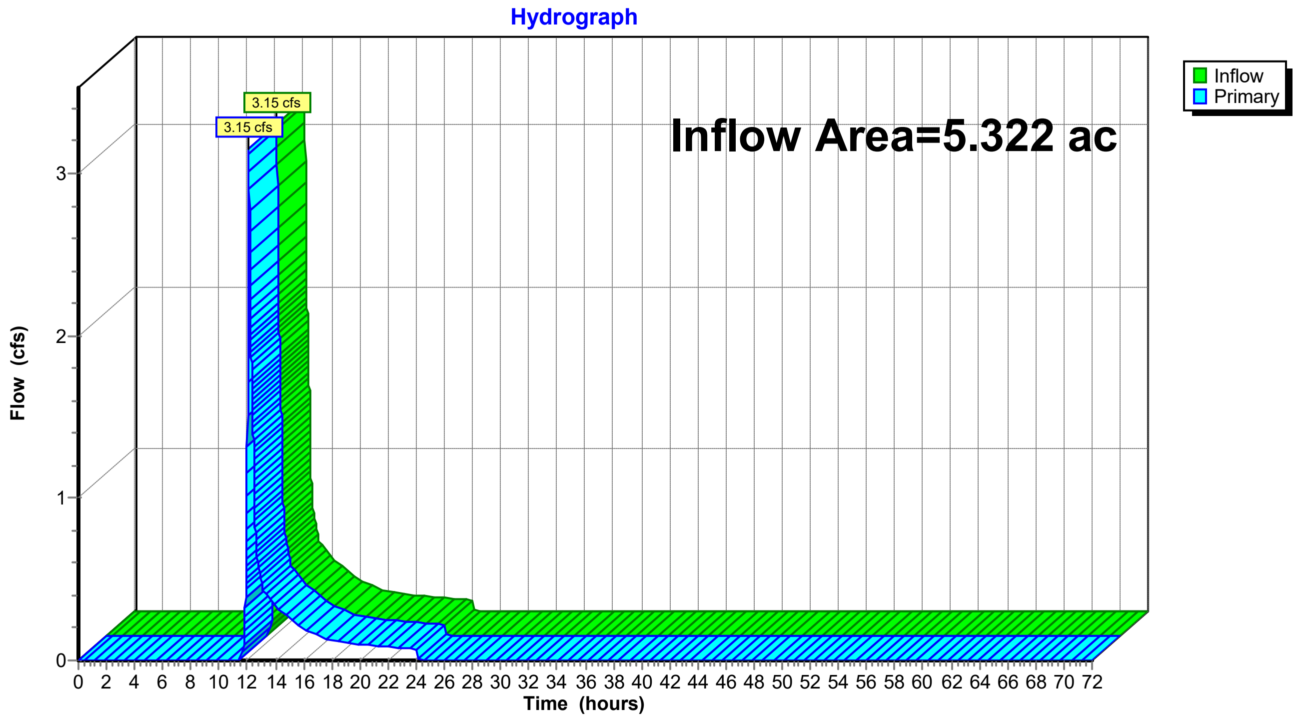


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.322 ac, 41.12% Impervious,	Inflow Depth = 0.60"	for 2-Year event
Inflow =	3.15 cfs @ 12.10 hrs,	Volume=	0.267 af
Primary =	3.15 cfs @ 12.10 hrs,	Volume=	0.267 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

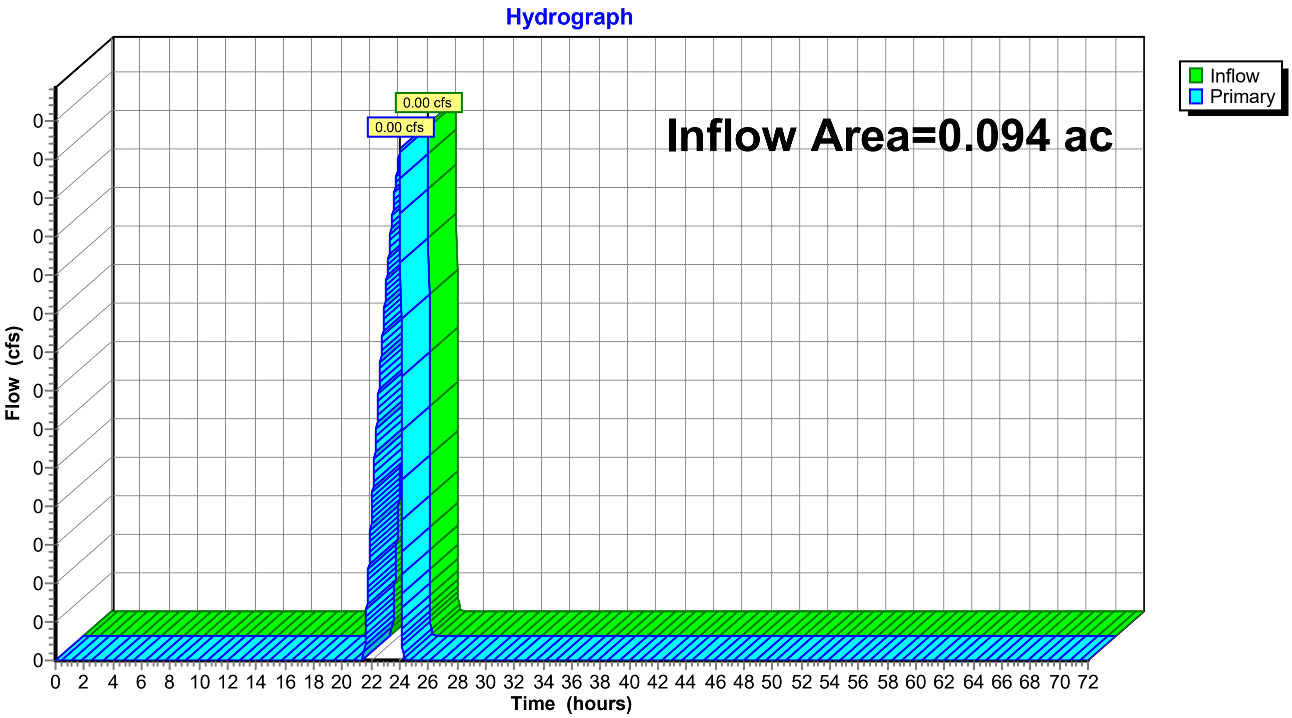


Summary for Link DP-2: Ditch

Inflow Area = 0.094 ac, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A: Subcatchment 1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=1.71"
Tc=6.0 min CN=67 Runoff=8.92 cfs 0.659 af

Subcatchment 1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=2.86"
Tc=6.0 min CN=81 Runoff=2.30 cfs 0.164 af

Subcatchment 2: Subcatchment 2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.17"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.001 af

Pond P1: Porous Pavement Peak Elev=161.46' Storage=515 cf Inflow=2.30 cfs 0.164 af
Discarded=1.19 cfs 0.164 af Primary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.164 af

Link DP-1: Reservoir and Swimming Area Inflow=8.92 cfs 0.659 af
Primary=8.92 cfs 0.659 af

Link DP-2: Ditch Inflow=0.00 cfs 0.001 af
Primary=0.00 cfs 0.001 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.824 af Average Runoff Depth = 1.83"
59.60% Pervious = 3.228 ac 40.40% Impervious = 2.188 ac

Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

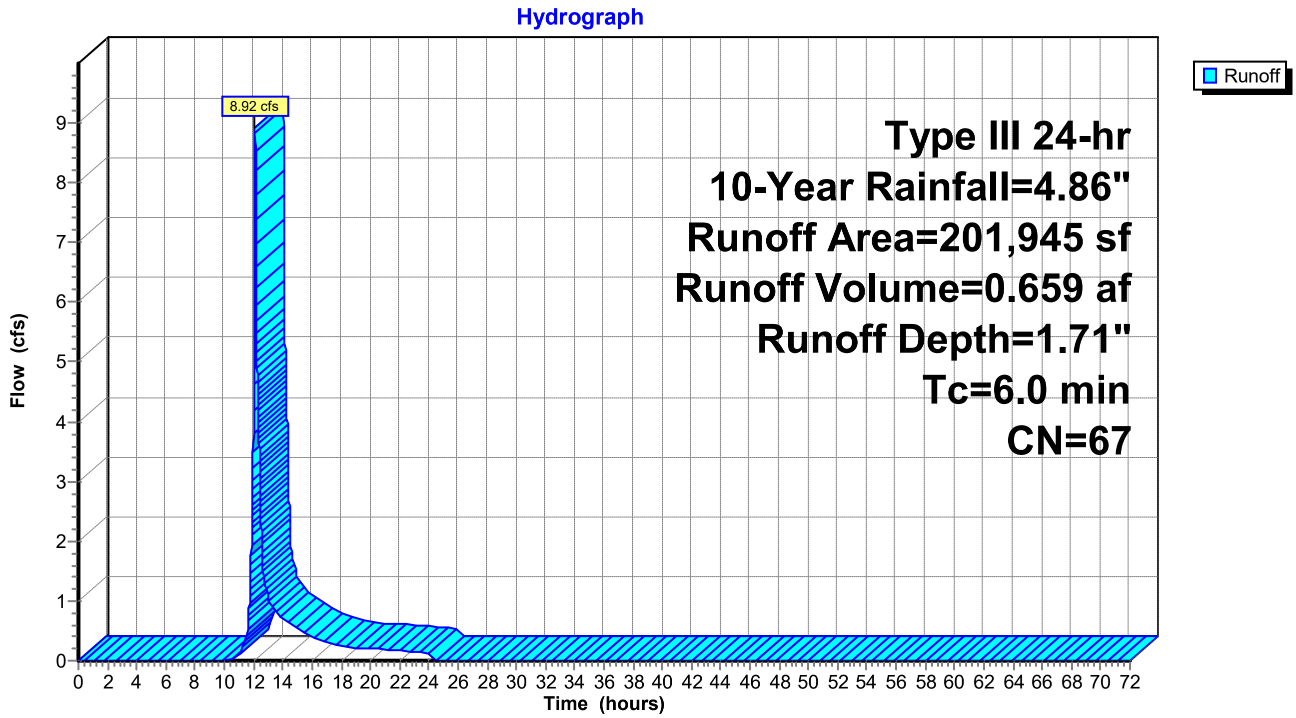
Runoff = 8.92 cfs @ 12.09 hrs, Volume= 0.659 af, Depth= 1.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

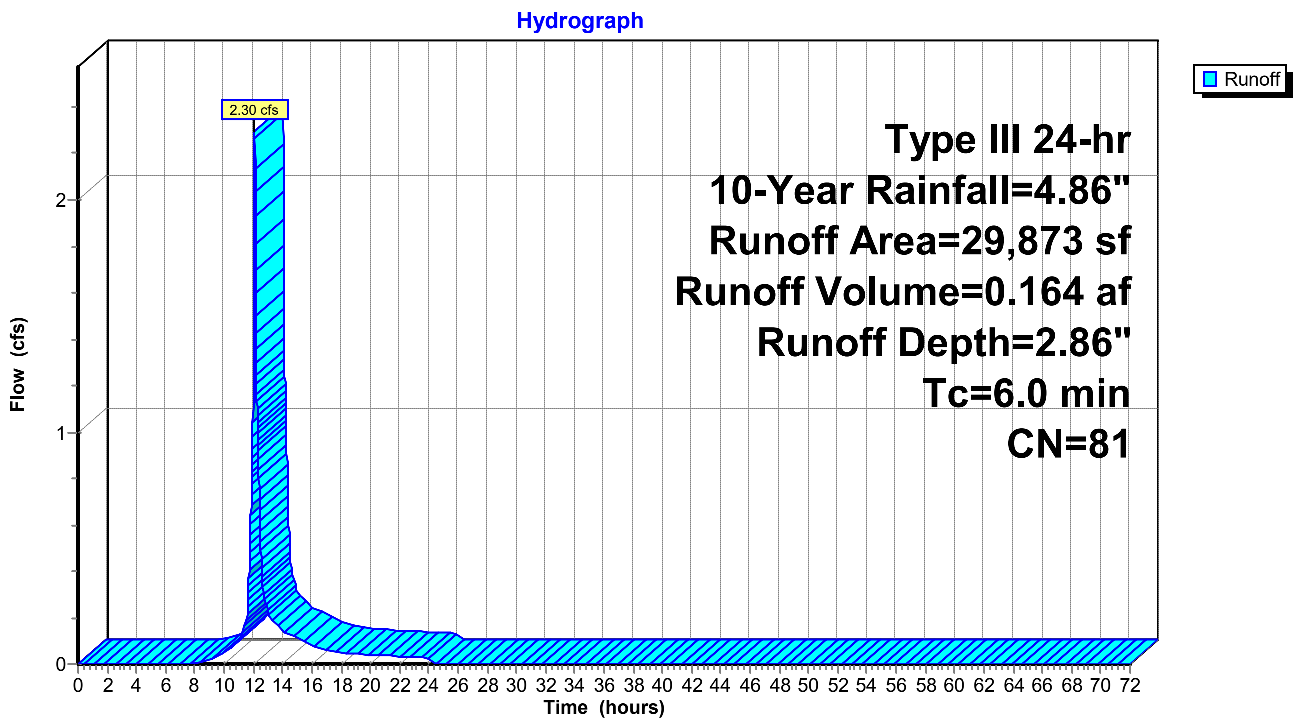
Runoff = 2.30 cfs @ 12.09 hrs, Volume= 0.164 af, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.86"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

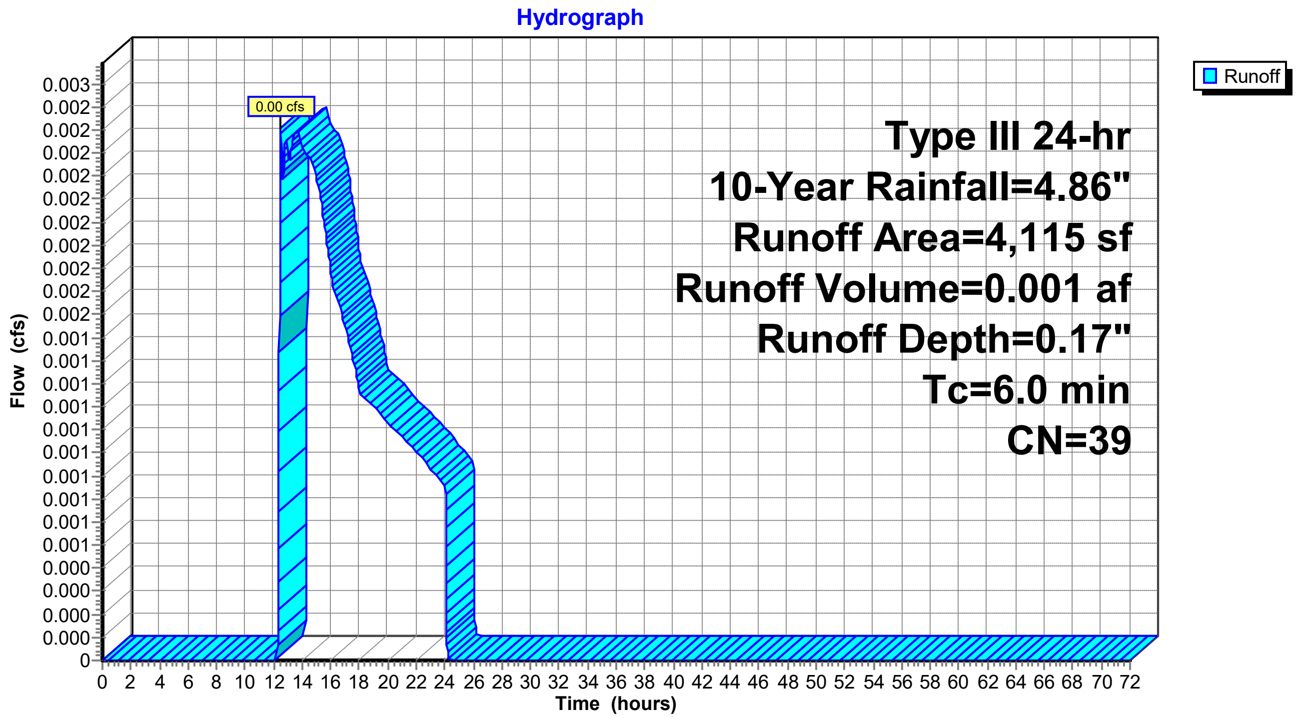
Runoff = 0.00 cfs @ 12.51 hrs, Volume= 0.001 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=4.86"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=576)

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 2.86" for 10-Year event
Inflow = 2.30 cfs @ 12.09 hrs, Volume= 0.164 af
Outflow = 1.19 cfs @ 12.09 hrs, Volume= 0.164 af, Atten= 48%, Lag= 0.1 min
Discarded = 1.19 cfs @ 12.09 hrs, Volume= 0.164 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.46' @ 12.23 hrs Surf.Area= 21,411 sf Storage= 515 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.6 min (821.9 - 820.3)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

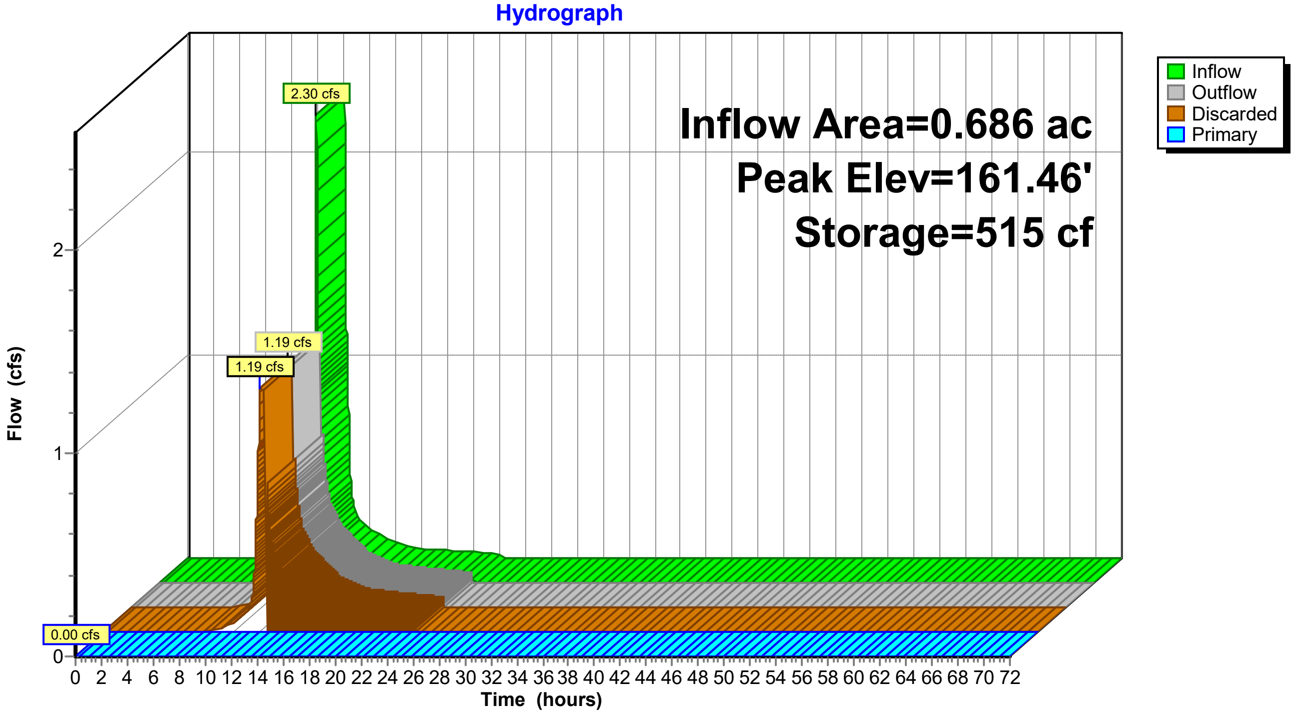
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.09 hrs HW=161.43' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

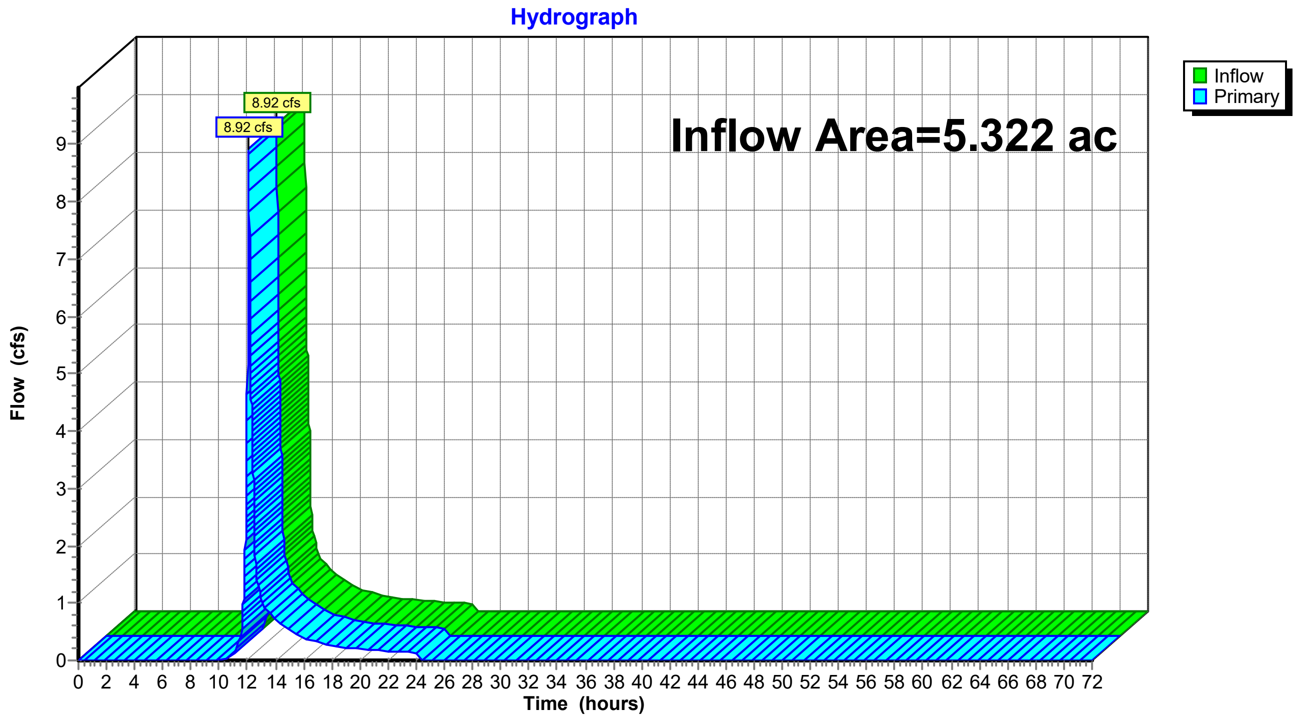


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.322 ac, 41.12% Impervious, Inflow Depth = 1.49" for 10-Year event			
Inflow =	8.92 cfs @	12.09 hrs, Volume=	0.659 af	
Primary =	8.92 cfs @	12.09 hrs, Volume=	0.659 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

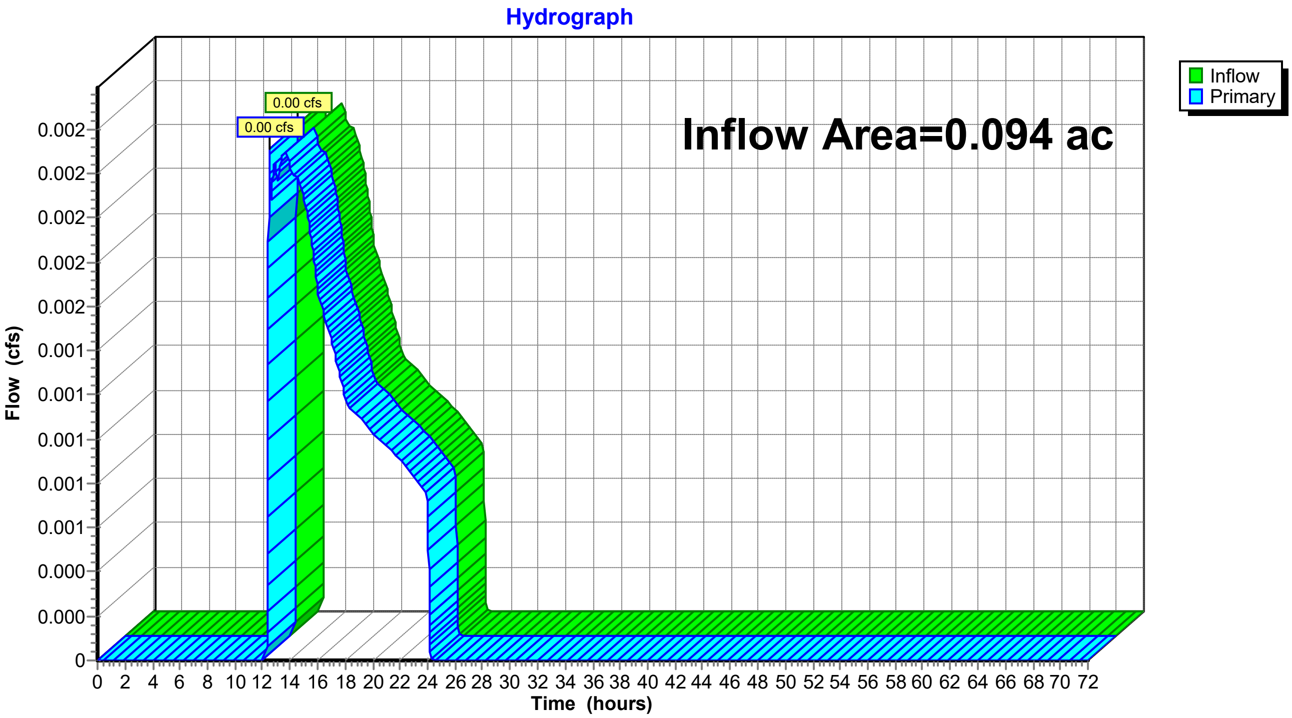


Summary for Link DP-2: Ditch

Inflow Area =	0.094 ac,	0.00% Impervious,	Inflow Depth = 0.17"	for 10-Year event	
Inflow =	0.00 cfs @	12.51 hrs,	Volume=	0.001 af	
Primary =	0.00 cfs @	12.51 hrs,	Volume=	0.001 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A: Subcatchment 1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=2.66"
Tc=6.0 min CN=67 Runoff=14.29 cfs 1.027 af

Subcatchment 1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=4.04"
Tc=6.0 min CN=81 Runoff=3.22 cfs 0.231 af

Subcatchment 2: Subcatchment 2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.50"
Tc=6.0 min CN=39 Runoff=0.02 cfs 0.004 af

Pond P1: Porous Pavement Peak Elev=161.55' Storage=1,280 cf Inflow=3.22 cfs 0.231 af
Discarded=1.19 cfs 0.231 af Primary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.231 af

Link DP-1: Reservoir and Swimming Area Inflow=14.29 cfs 1.027 af
Primary=14.29 cfs 1.027 af

Link DP-2: Ditch Inflow=0.02 cfs 0.004 af
Primary=0.02 cfs 0.004 af

Total Runoff Area = 5.416 ac Runoff Volume = 1.262 af Average Runoff Depth = 2.80"
59.60% Pervious = 3.228 ac 40.40% Impervious = 2.188 ac

Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

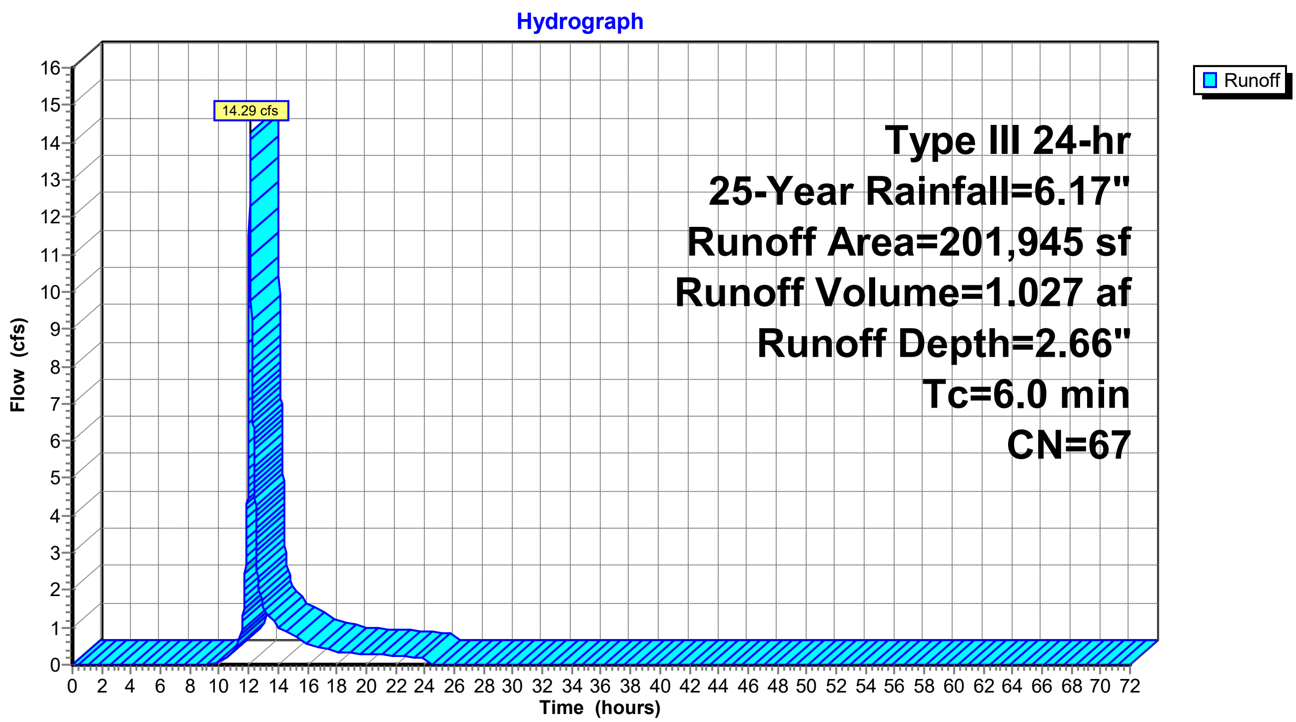
Runoff = 14.29 cfs @ 12.09 hrs, Volume= 1.027 af, Depth= 2.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.17"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

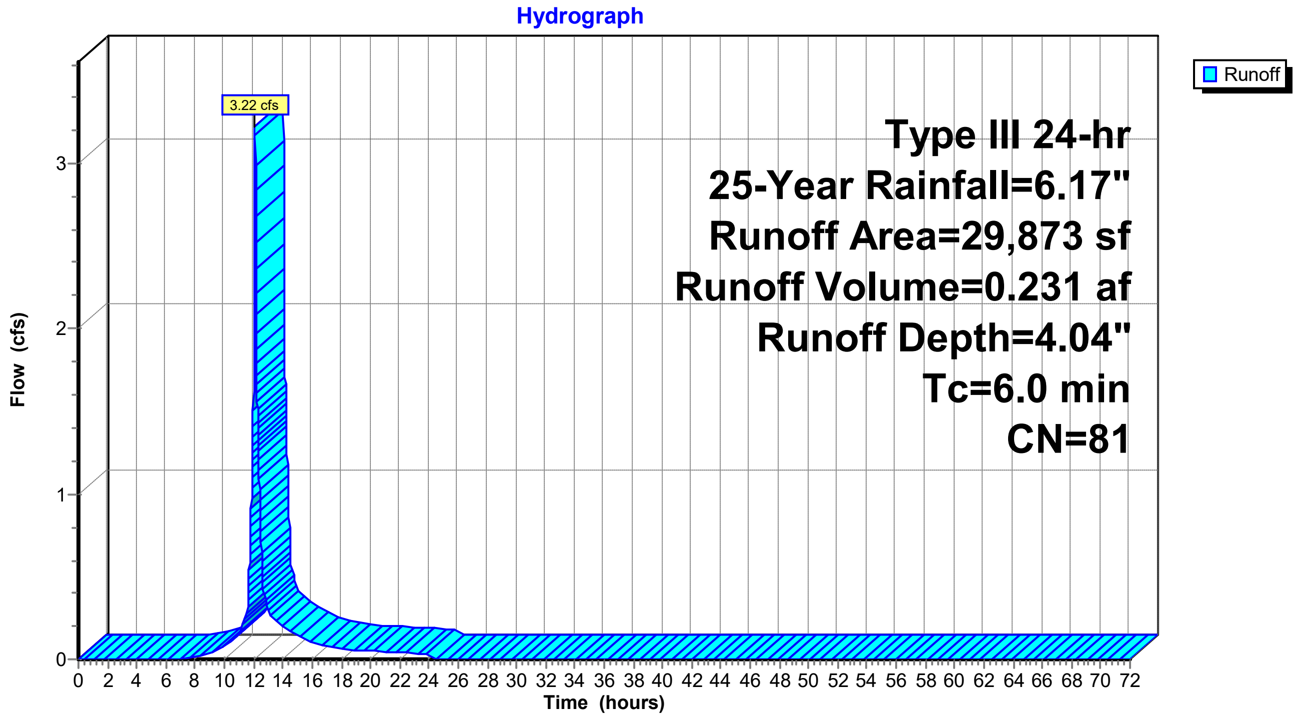
Runoff = 3.22 cfs @ 12.09 hrs, Volume= 0.231 af, Depth= 4.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.17"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

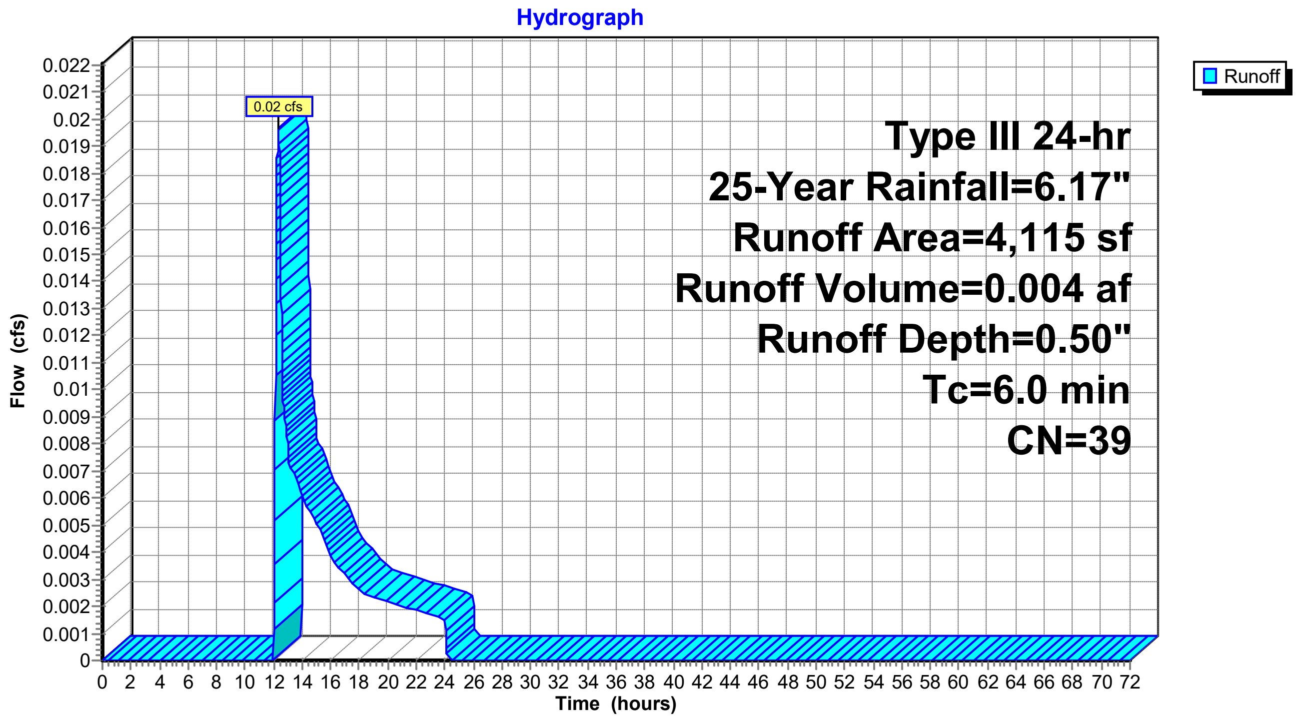
Runoff = 0.02 cfs @ 12.33 hrs, Volume= 0.004 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.17"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=560)

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 4.04" for 25-Year event
Inflow = 3.22 cfs @ 12.09 hrs, Volume= 0.231 af
Outflow = 1.19 cfs @ 12.04 hrs, Volume= 0.231 af, Atten= 63%, Lag= 0.0 min
Discarded = 1.19 cfs @ 12.04 hrs, Volume= 0.231 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.55' @ 12.35 hrs Surf.Area= 21,411 sf Storage= 1,280 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 4.6 min (815.0 - 810.4)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

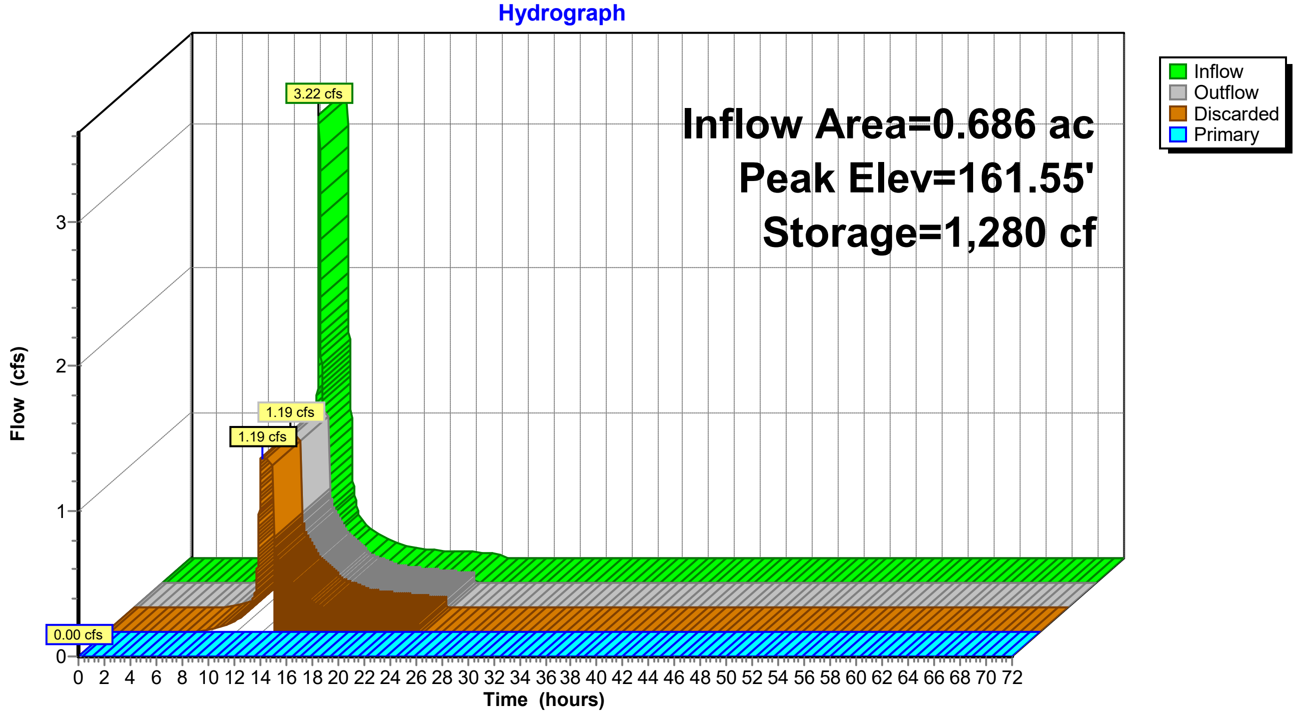
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.04 hrs HW=161.43' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

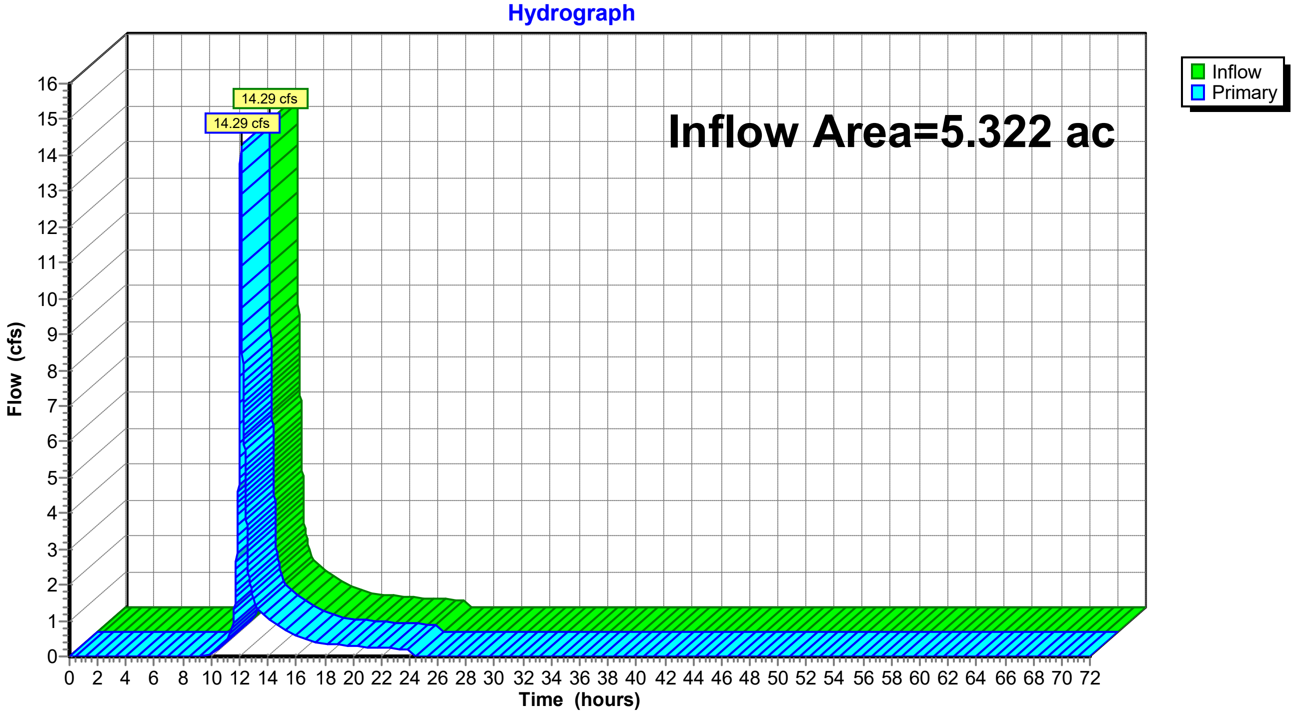


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.322 ac, 41.12% Impervious, Inflow Depth = 2.32" for 25-Year event
Inflow = 14.29 cfs @ 12.09 hrs, Volume= 1.027 af
Primary = 14.29 cfs @ 12.09 hrs, Volume= 1.027 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

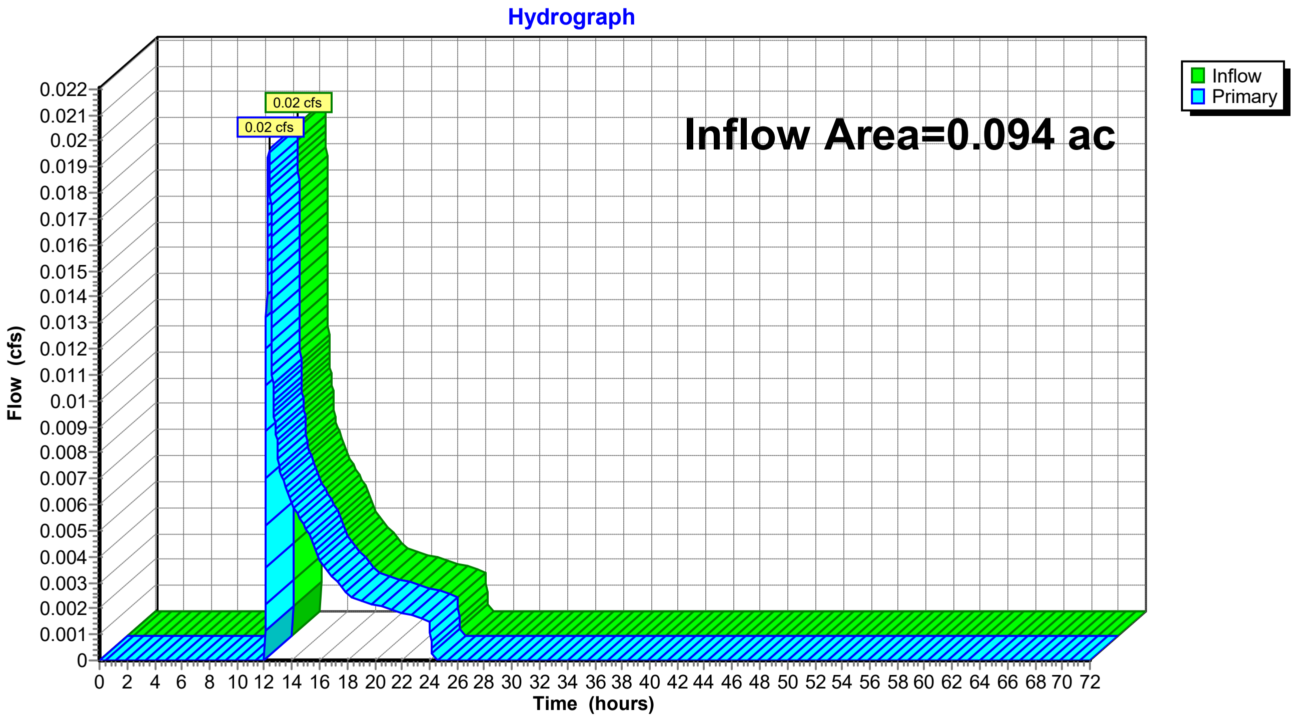


Summary for Link DP-2: Ditch

Inflow Area =	0.094 ac,	0.00% Impervious, Inflow Depth = 0.50"	for 25-Year event	
Inflow =	0.02 cfs @	12.33 hrs, Volume=	0.004 af	
Primary =	0.02 cfs @	12.33 hrs, Volume=	0.004 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1A: Subcatchment 1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=4.84"
Tc=6.0 min CN=67 Runoff=26.30 cfs 1.868 af

Subcatchment 1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=6.55"
Tc=6.0 min CN=81 Runoff=5.13 cfs 0.374 af

Subcatchment 2: Subcatchment 2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=1.53"
Tc=6.0 min CN=39 Runoff=0.13 cfs 0.012 af

Pond P1: Porous Pavement Peak Elev=161.81' Storage=3,521 cf Inflow=5.13 cfs 0.374 af
Discarded=1.19 cfs 0.374 af Primary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.374 af

Link DP-1: Reservoir and Swimming Area Inflow=26.30 cfs 1.868 af
Primary=26.30 cfs 1.868 af

Link DP-2: Ditch Inflow=0.13 cfs 0.012 af
Primary=0.13 cfs 0.012 af

Total Runoff Area = 5.416 ac Runoff Volume = 2.255 af Average Runoff Depth = 5.00"
59.60% Pervious = 3.228 ac 40.40% Impervious = 2.188 ac

Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

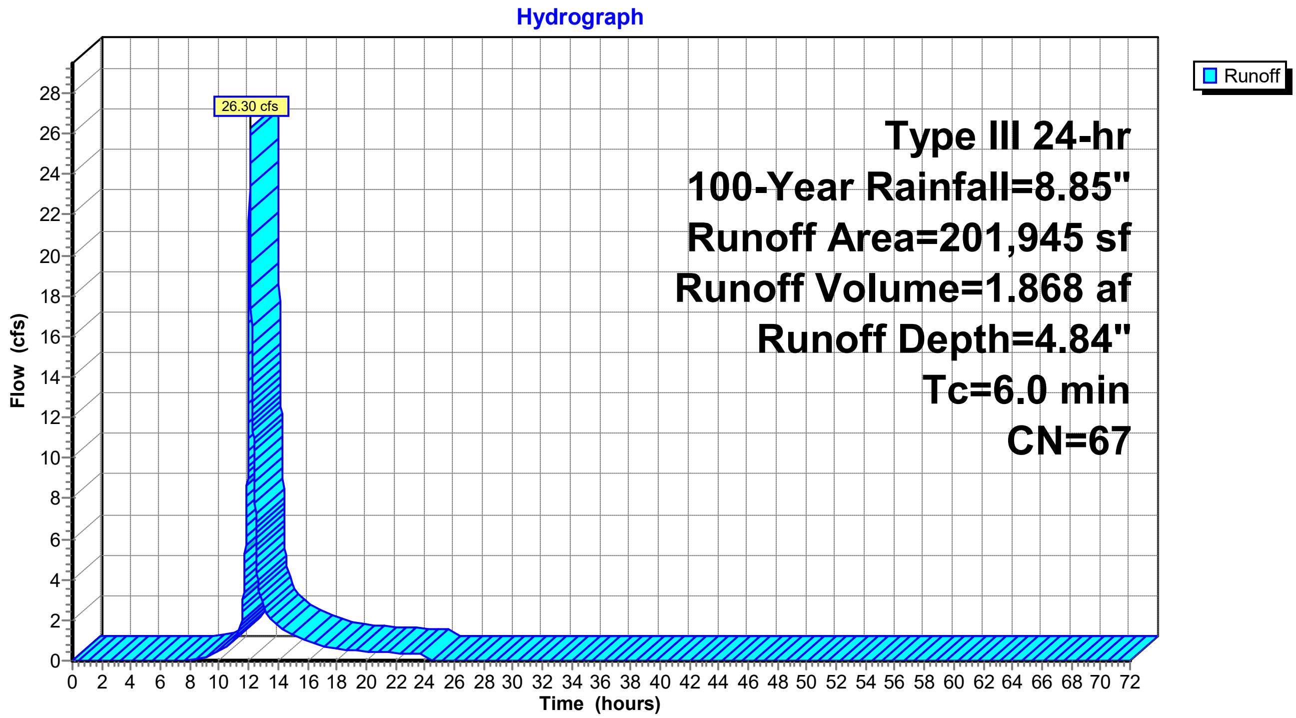
Runoff = 26.30 cfs @ 12.09 hrs, Volume= 1.868 af, Depth= 4.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.85"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

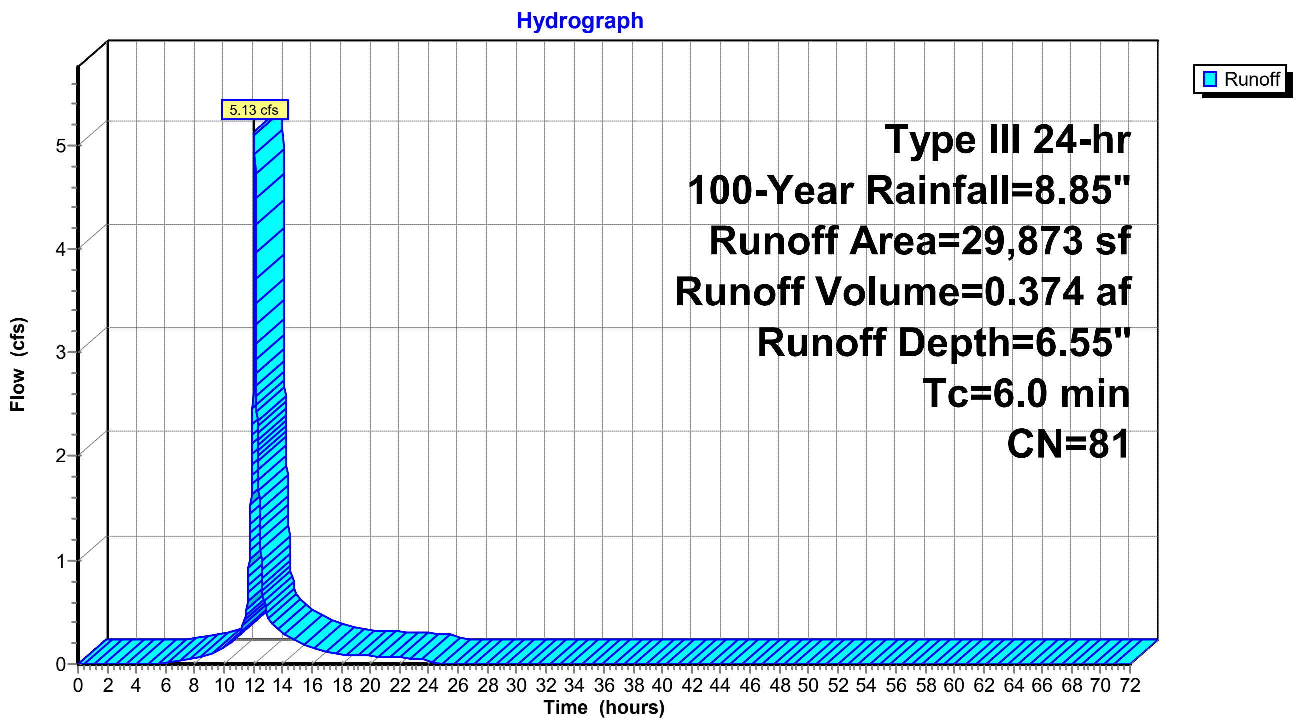
Runoff = 5.13 cfs @ 12.09 hrs, Volume= 0.374 af, Depth= 6.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.85"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

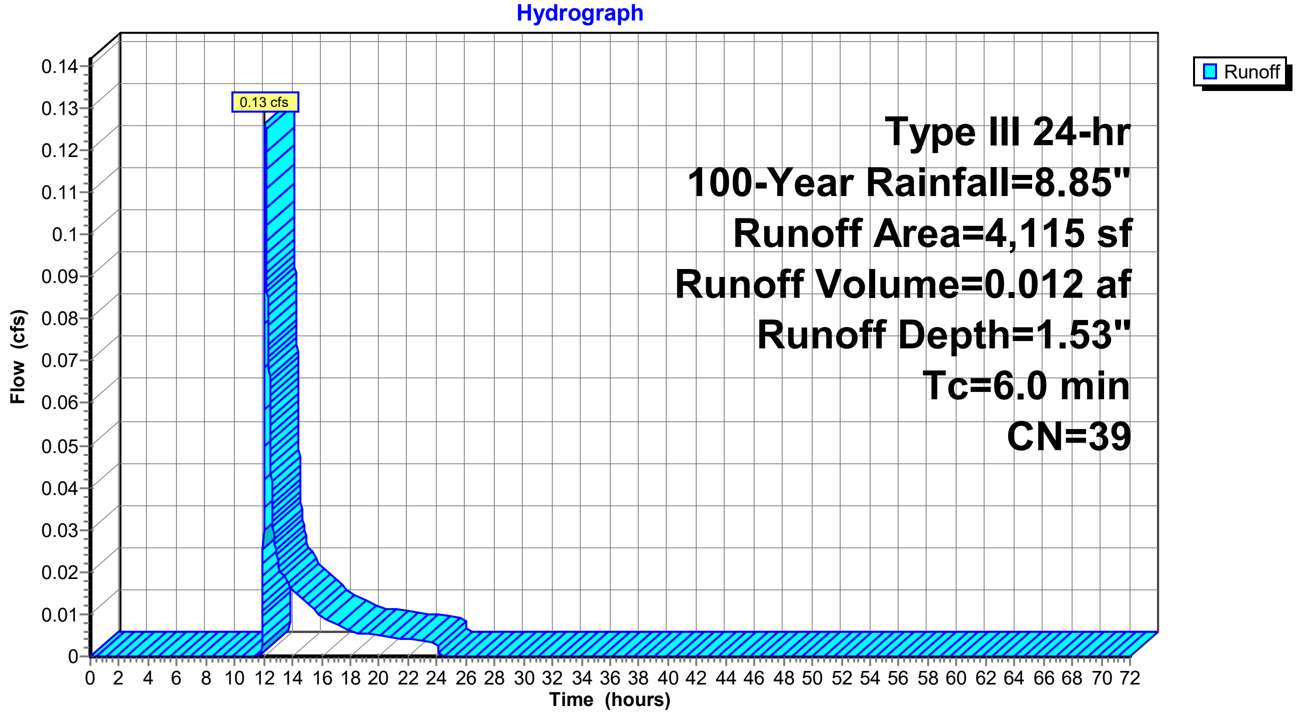
Runoff = 0.13 cfs @ 12.11 hrs, Volume= 0.012 af, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.85"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=514)

Inflow Area =	0.686 ac,	71.84% Impervious,	Inflow Depth = 6.55"	for 100-Year event
Inflow =	5.13 cfs @	12.09 hrs, Volume=	0.374 af	
Outflow =	1.19 cfs @	11.92 hrs, Volume=	0.374 af, Atten= 77%, Lag= 0.0 min	
Discarded =	1.19 cfs @	11.92 hrs, Volume=	0.374 af	
Primary =	0.00 cfs @	0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.81' @ 12.48 hrs Surf.Area= 21,411 sf Storage= 3,521 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 14.9 min (811.7 - 796.9)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

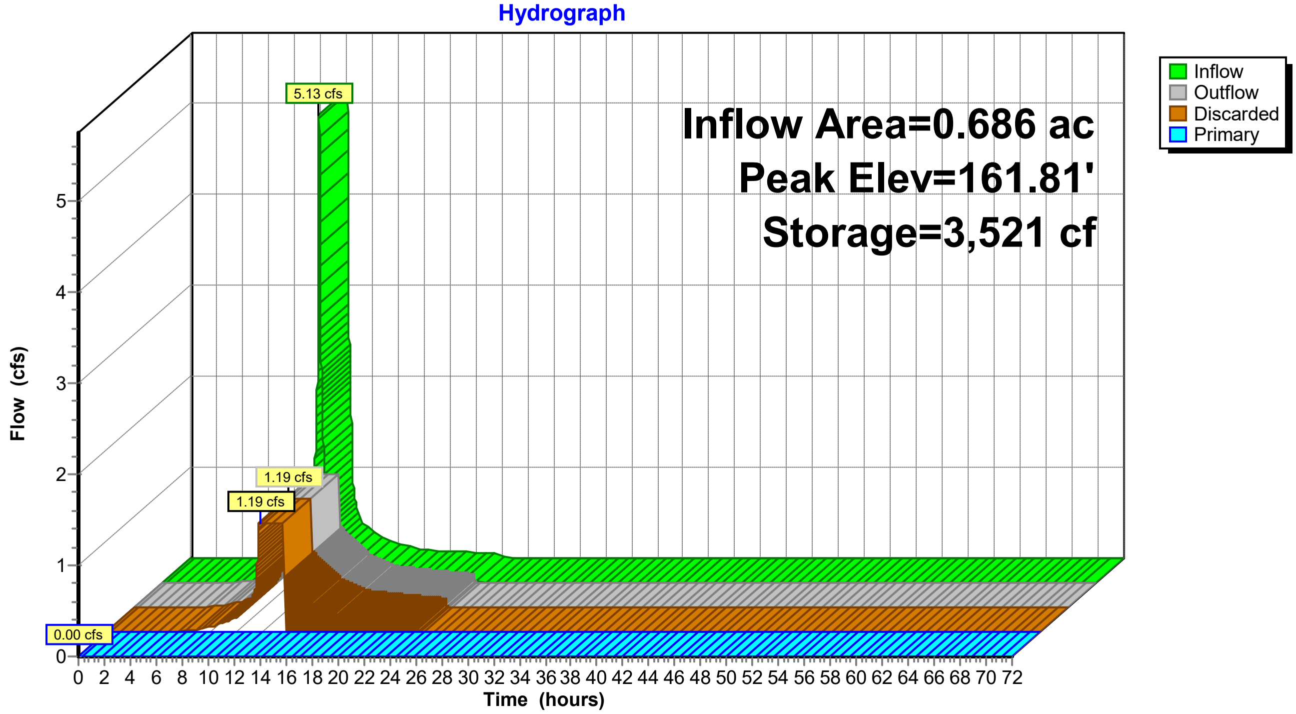
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 11.92 hrs HW=161.43' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

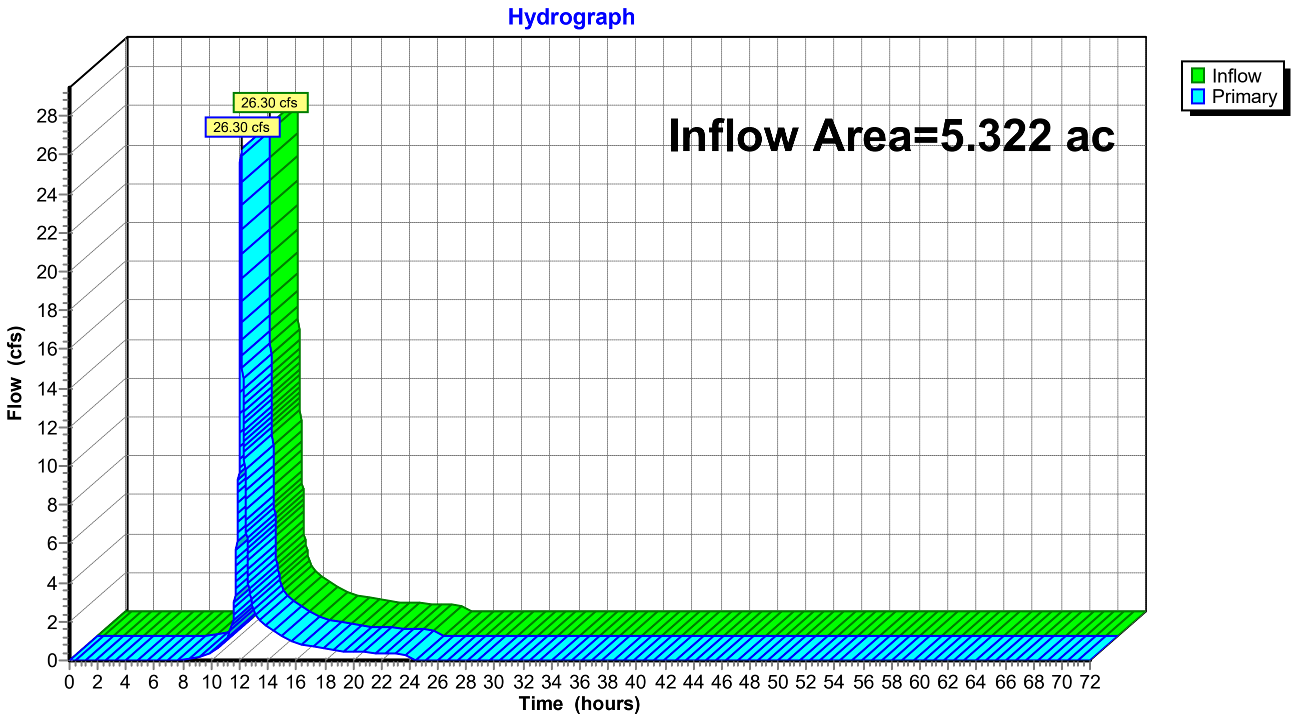


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.322 ac, 41.12% Impervious, Inflow Depth = 4.21" for 100-Year event
Inflow = 26.30 cfs @ 12.09 hrs, Volume= 1.868 af
Primary = 26.30 cfs @ 12.09 hrs, Volume= 1.868 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

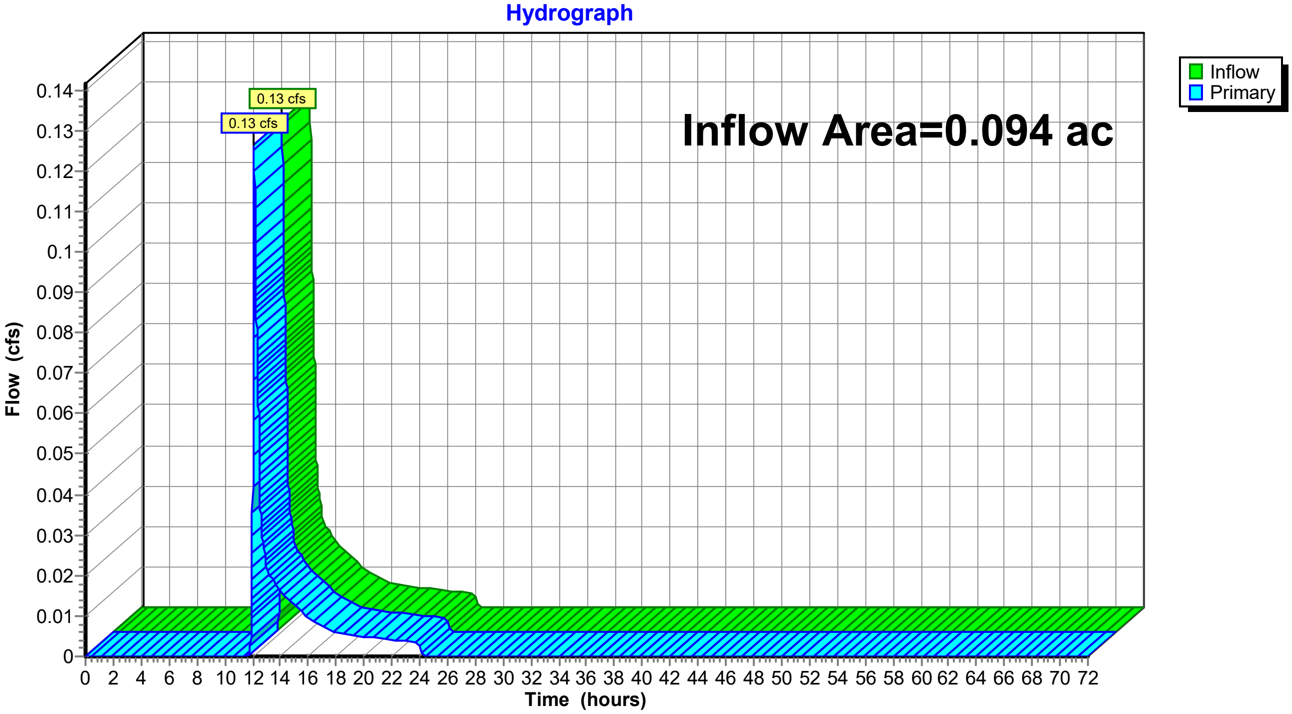


Summary for Link DP-2: Ditch

Inflow Area = 0.094 ac, 0.00% Impervious, Inflow Depth = 1.53" for 100-Year event
Inflow = 0.13 cfs @ 12.11 hrs, Volume= 0.012 af
Primary = 0.13 cfs @ 12.11 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.0 min

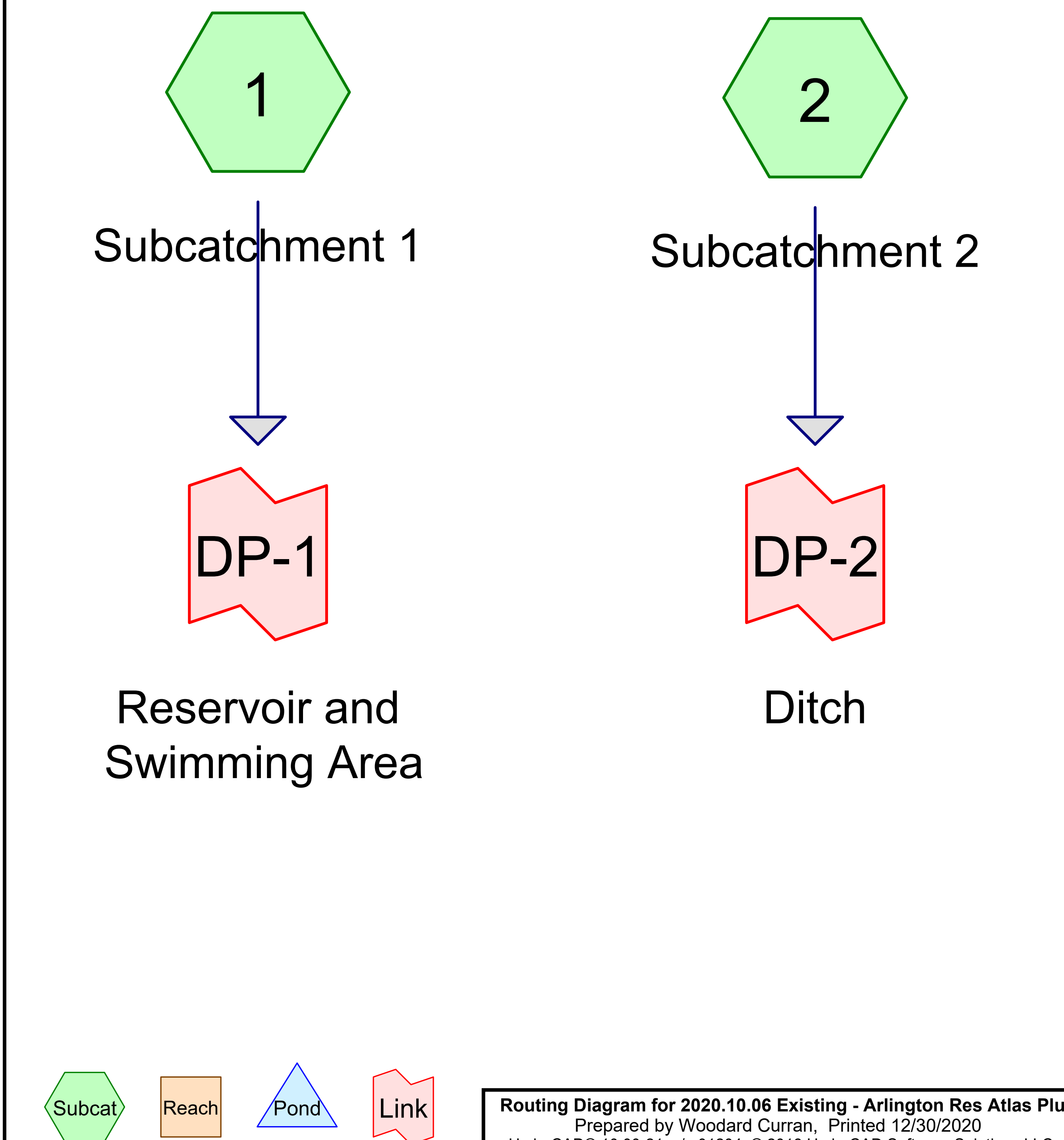
Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



APPENDIX D CONTINUED:

HYDROCAD STORMWATER MODEL REPORTS FOR ATLAS 14 PLUS ANALYSIS



Routing Diagram for 2020.10.06 Existing - Arlington Res Atlas Plus
Prepared by Woodard Curran, Printed 12/30/2020
HydroCAD® 10.00-21 s/n 01204 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
1.531	49	50-75% Grass cover, Fair, HSG A (1, 2)
1.317	63	Beach Sand, HSG A (1)
0.379	30	Brush, Good, HSG A (1, 2)
0.046	96	Dense Sand Path, HSG A (1)
0.646	98	Gravel parking, HSG A (1, 2)
0.234	98	Impervious Surface, HSG A (1, 2)
0.055	39	Open Space, Good, HSG A (>75% Grass Cover) (1)
1.207	98	Water Surface, HSG A (1)
5.416	**70**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
5.416	HSG A	1, 2
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
5.416		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
1.531	0.000	0.000	0.000	0.000	1.531	50-75% Grass cover, Fair	1, 2
1.317	0.000	0.000	0.000	0.000	1.317	Beach Sand	1
0.379	0.000	0.000	0.000	0.000	0.379	Brush, Good	1, 2
0.046	0.000	0.000	0.000	0.000	0.046	Dense Sand Path	1
0.646	0.000	0.000	0.000	0.000	0.646	Gravel parking	1, 2
0.234	0.000	0.000	0.000	0.000	0.234	Impervious Surface	1, 2
0.055	0.000	0.000	0.000	0.000	0.055	Open Space, Good	1
1.207	0.000	0.000	0.000	0.000	1.207	Water Surface	1
5.416	**0.000**	**0.000**	**0.000**	**0.000**	**5.416**	**TOTAL AREA**	

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcatchment1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=71 Runoff=3.86 cfs 0.313 af

Subcatchment2: Subcatchment2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=0.44"
Tc=6.0 min CN=64 Runoff=0.07 cfs 0.007 af

Link DP-1: Reservoir and Swimming Area Inflow=3.86 cfs 0.313 af
Primary=3.86 cfs 0.313 af

Link DP-2: Ditch Inflow=0.07 cfs 0.007 af
Primary=0.07 cfs 0.007 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.321 af Average Runoff Depth = 0.71"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

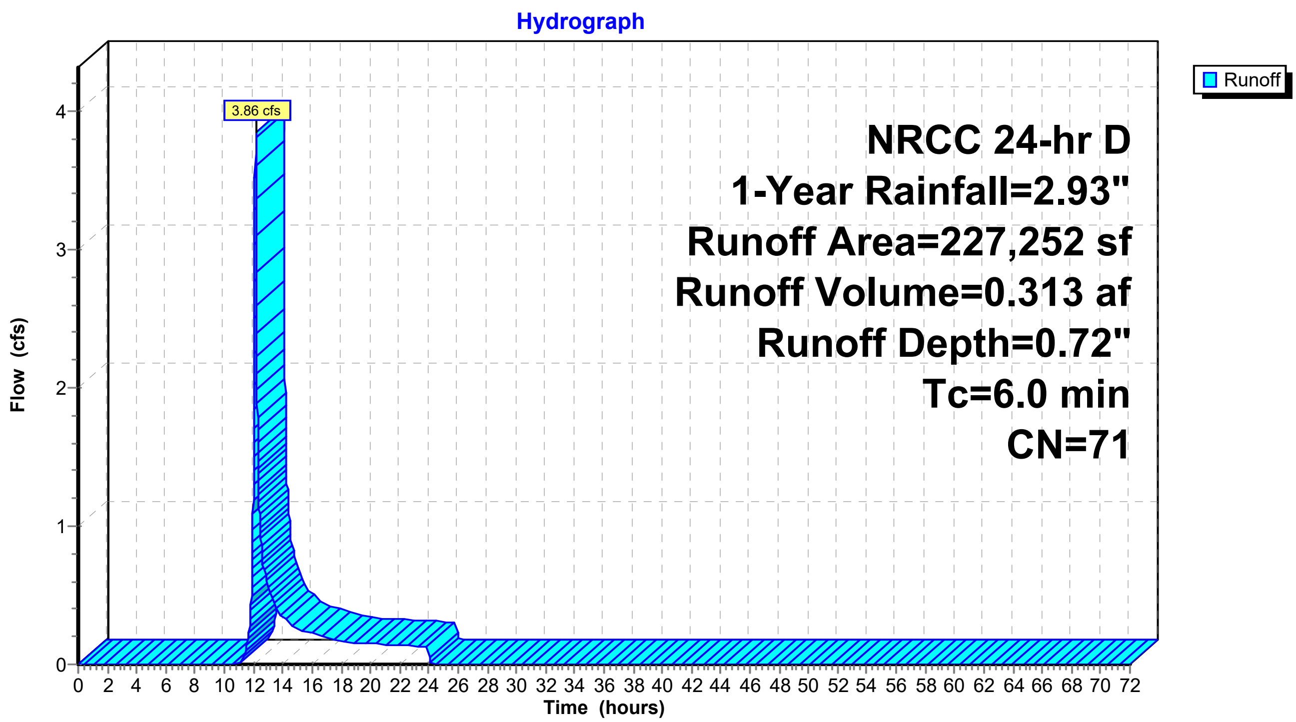
Runoff = 3.86 cfs @ 12.14 hrs, Volume= 0.313 af, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 1-Year Rainfall=2.93"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

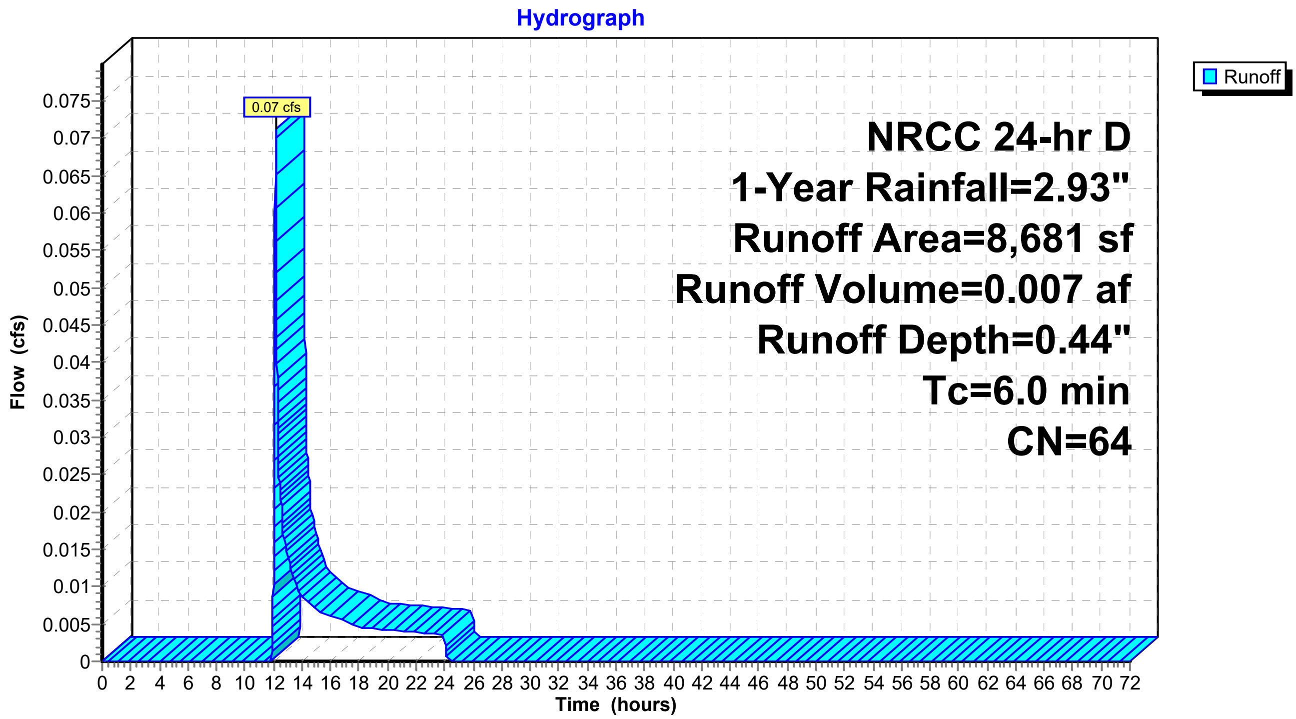
Runoff = 0.07 cfs @ 12.14 hrs, Volume= 0.007 af, Depth= 0.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 1-Year Rainfall=2.93"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

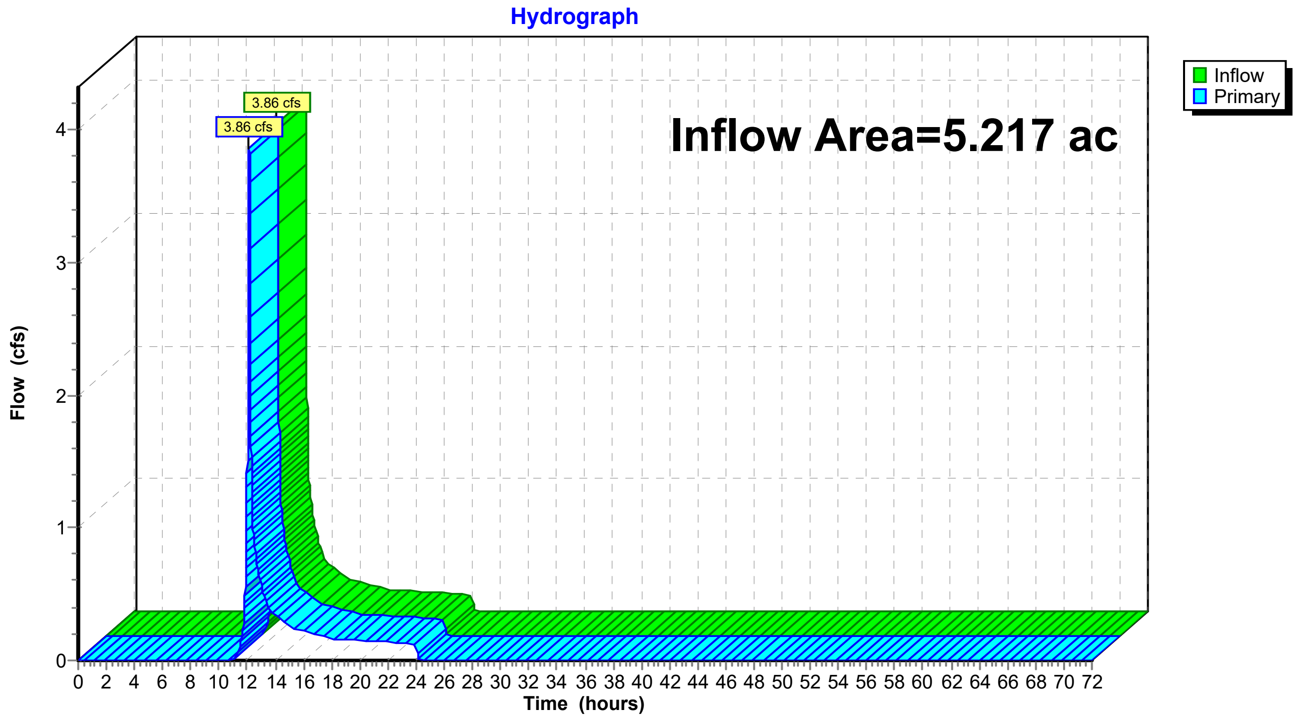


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.217 ac, 38.51% Impervious, Inflow Depth = 0.72" for 1-Year event
Inflow = 3.86 cfs @ 12.14 hrs, Volume= 0.313 af
Primary = 3.86 cfs @ 12.14 hrs, Volume= 0.313 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

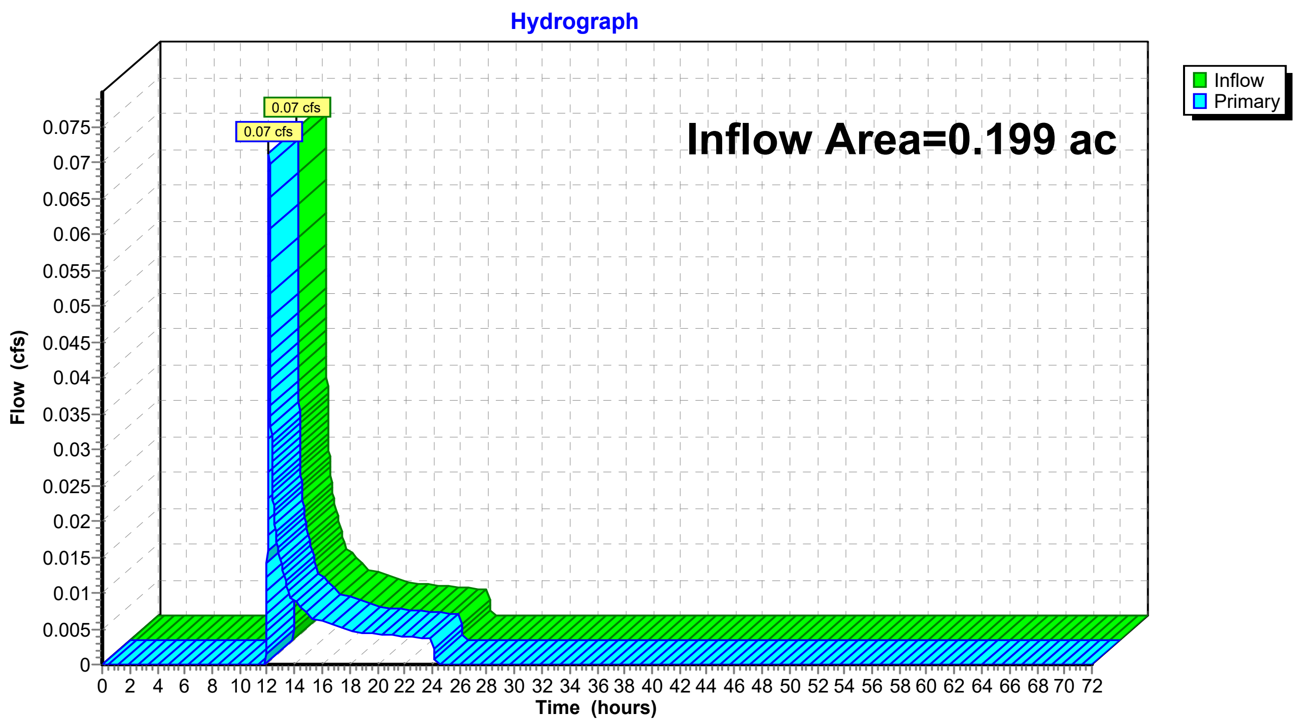


Summary for Link DP-2: Ditch

Inflow Area =	0.199 ac, 39.47% Impervious, Inflow Depth = 0.44"	for 1-Year event	
Inflow =	0.07 cfs @ 12.14 hrs, Volume=	0.007 af	
Primary =	0.07 cfs @ 12.14 hrs, Volume=	0.007 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcatchment1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=1.15"
Tc=6.0 min CN=71 Runoff=6.51 cfs 0.502 af

Subcatchment2: Subcatchment2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=0.78"
Tc=6.0 min CN=64 Runoff=0.15 cfs 0.013 af

Link DP-1: Reservoir and Swimming Area Inflow=6.51 cfs 0.502 af
Primary=6.51 cfs 0.502 af

Link DP-2: Ditch Inflow=0.15 cfs 0.013 af
Primary=0.15 cfs 0.013 af

Total Runoff Area = 5.416 ac Runoff Volume = 0.515 af Average Runoff Depth = 1.14"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

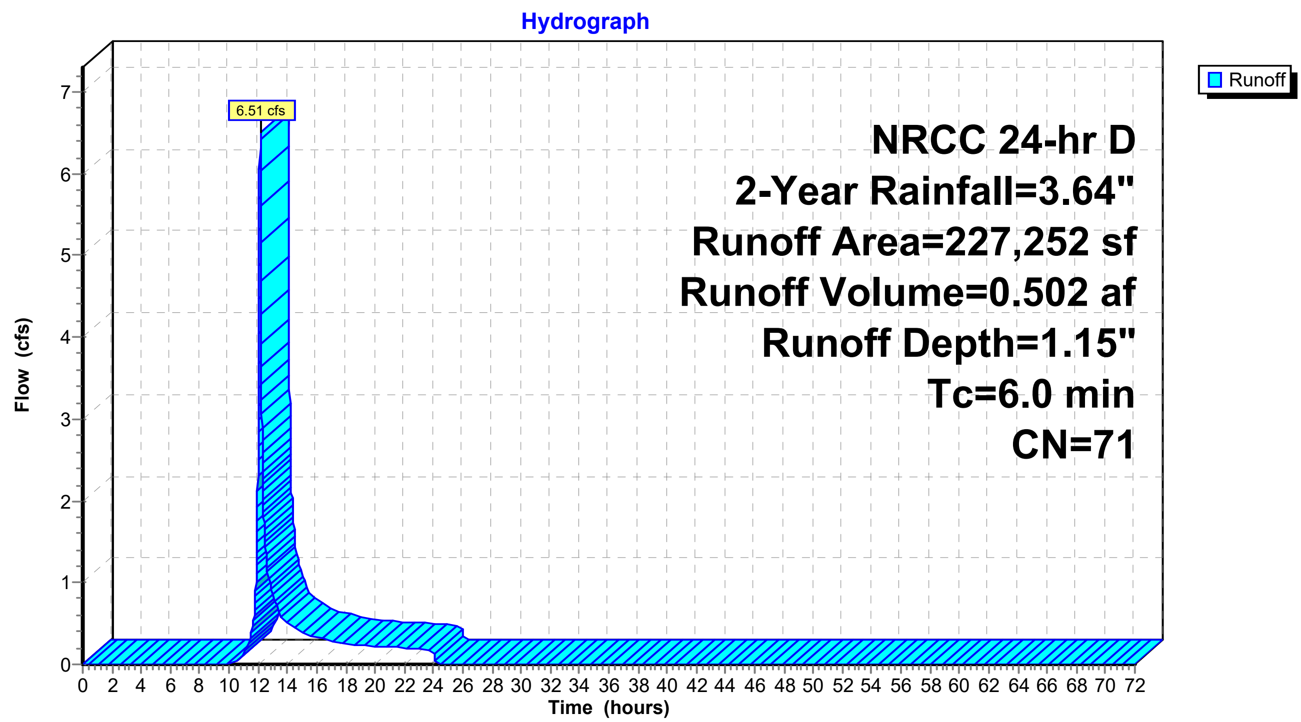
Runoff = 6.51 cfs @ 12.14 hrs, Volume= 0.502 af, Depth= 1.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.64"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

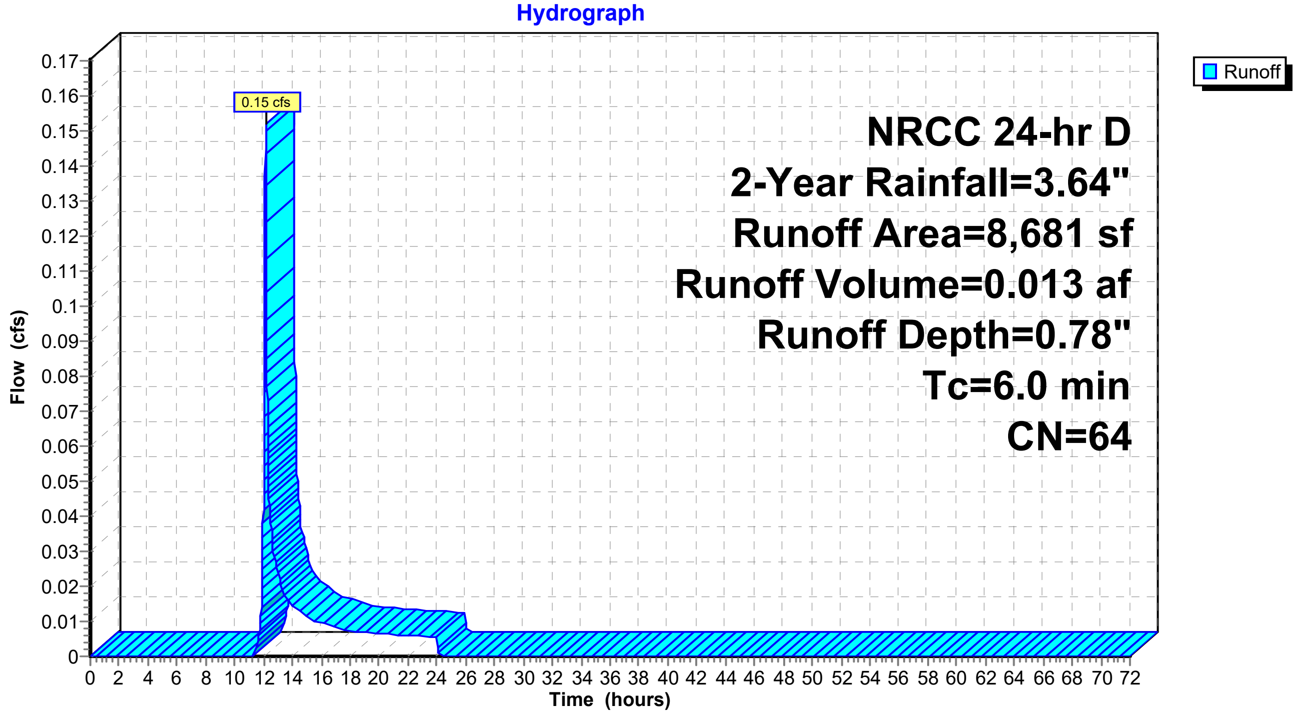
Runoff = 0.15 cfs @ 12.14 hrs, Volume= 0.013 af, Depth= 0.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.64"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

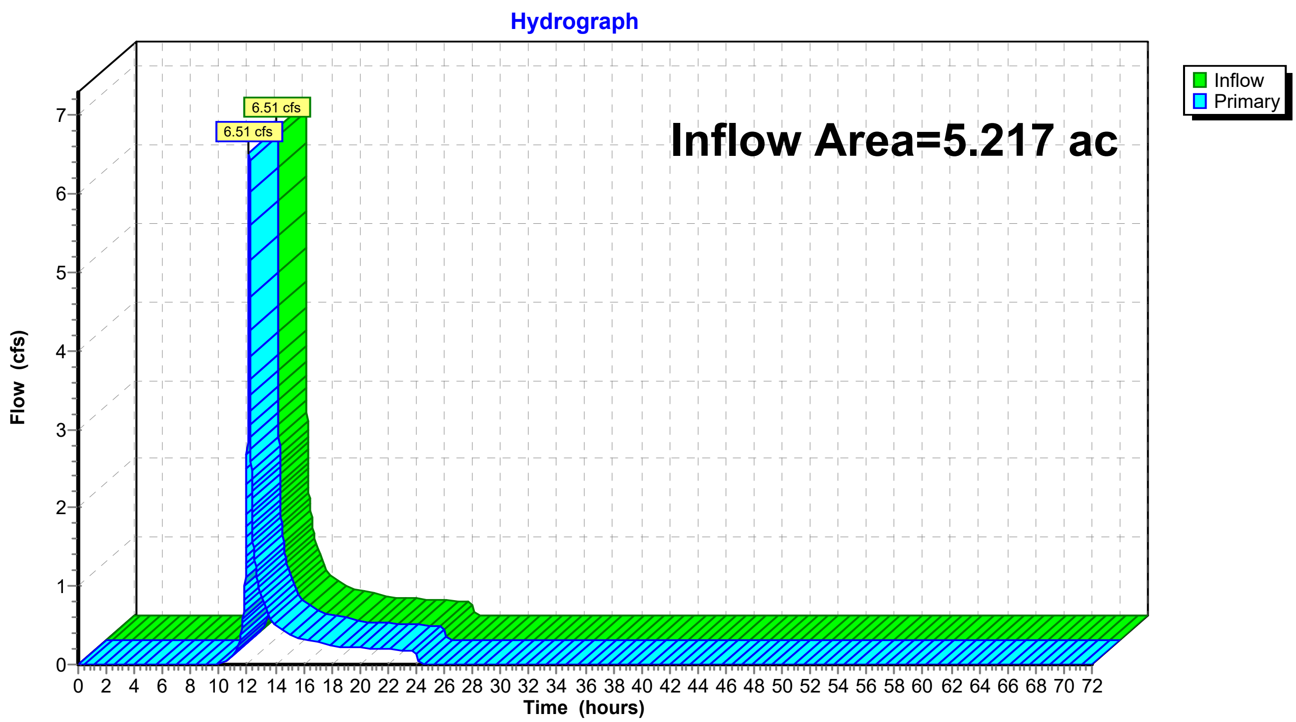


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.217 ac,	38.51% Impervious,	Inflow Depth = 1.15"	for 2-Year event	
Inflow =	6.51 cfs @	12.14 hrs,	Volume=	0.502 af	
Primary =	6.51 cfs @	12.14 hrs,	Volume=	0.502 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

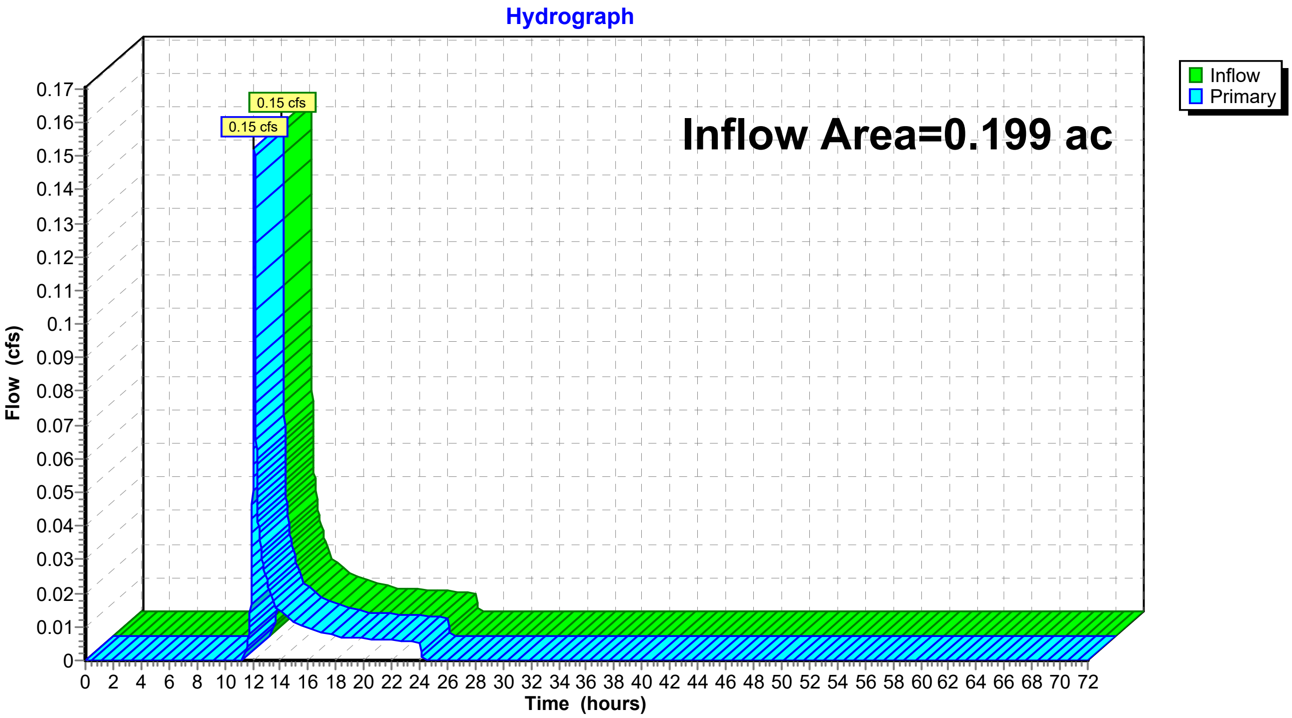


Summary for Link DP-2: Ditch

Inflow Area =	0.199 ac,	39.47% Impervious,	Inflow Depth = 0.78"	for 2-Year event
Inflow =	0.15 cfs @	12.14 hrs,	Volume=	0.013 af
Primary =	0.15 cfs @	12.14 hrs,	Volume=	0.013 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcatchment1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=2.73"
Tc=6.0 min CN=71 Runoff=15.91 cfs 1.187 af

Subcatchment2: Subcatchment2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=2.11"
Tc=6.0 min CN=64 Runoff=0.46 cfs 0.035 af

Link DP-1: Reservoir and Swimming Area Inflow=15.91 cfs 1.187 af
Primary=15.91 cfs 1.187 af

Link DP-2: Ditch Inflow=0.46 cfs 0.035 af
Primary=0.46 cfs 0.035 af

Total Runoff Area = 5.416 ac Runoff Volume = 1.222 af Average Runoff Depth = 2.71"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

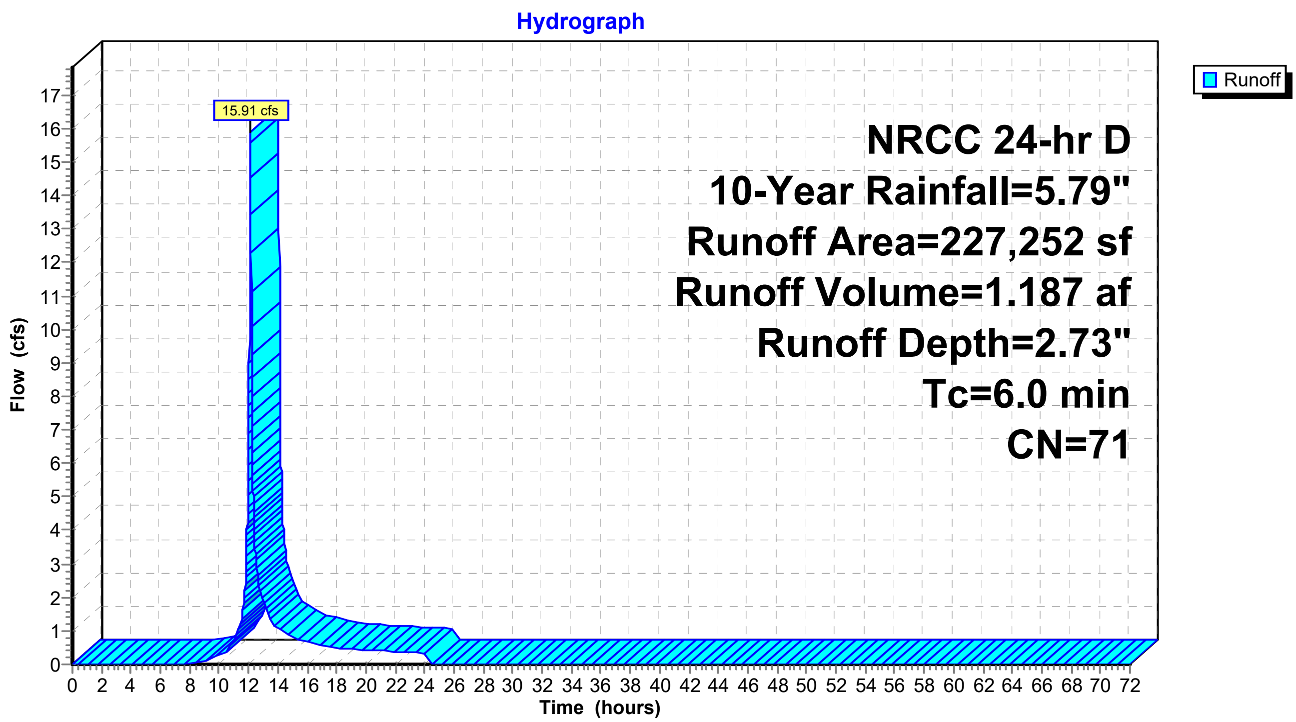
Runoff = 15.91 cfs @ 12.13 hrs, Volume= 1.187 af, Depth= 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=5.79"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

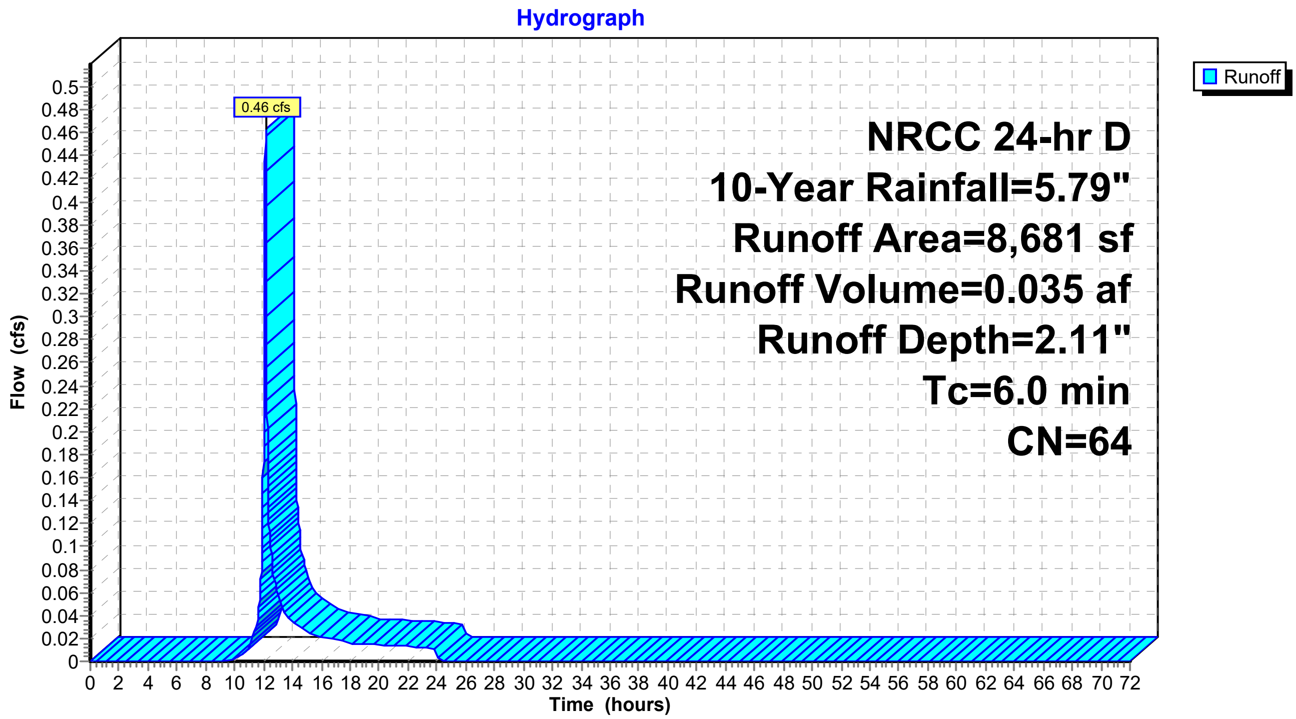
Runoff = 0.46 cfs @ 12.13 hrs, Volume= 0.035 af, Depth= 2.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=5.79"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

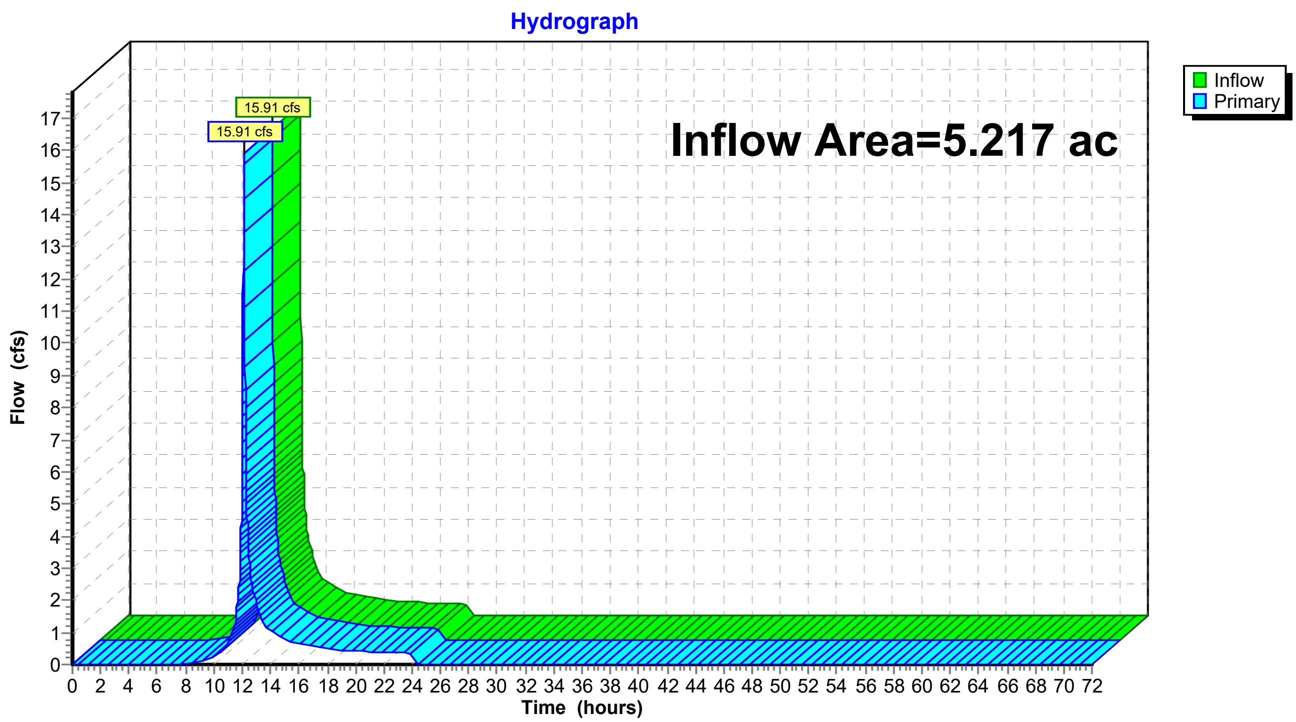


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.217 ac, 38.51% Impervious,	Inflow Depth = 2.73"	for 10-Year event	
Inflow =	15.91 cfs @	12.13 hrs, Volume=	1.187 af	
Primary =	15.91 cfs @	12.13 hrs, Volume=	1.187 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

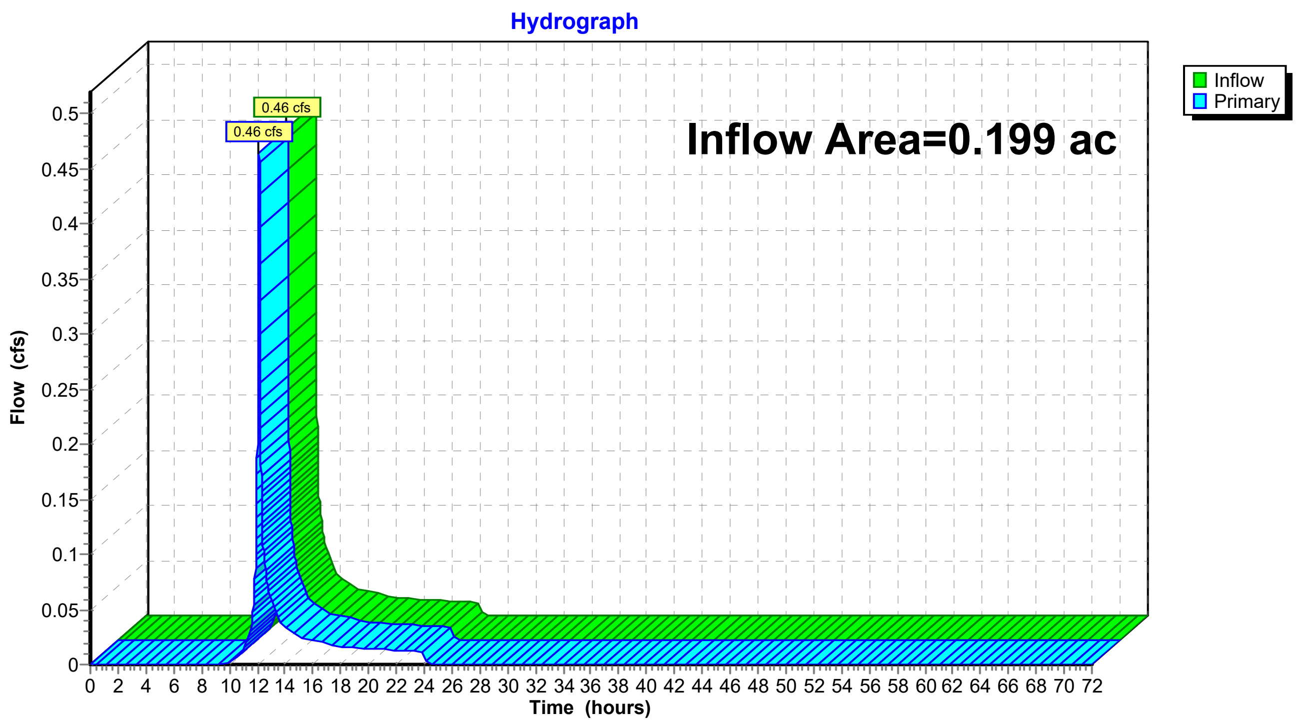


Summary for Link DP-2: Ditch

Inflow Area =	0.199 ac, 39.47% Impervious, Inflow Depth = 2.11"	for 10-Year event	
Inflow =	0.46 cfs @ 12.13 hrs, Volume=	0.035 af	
Primary =	0.46 cfs @ 12.13 hrs, Volume=	0.035 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcatchment1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=4.13"
Tc=6.0 min CN=71 Runoff=24.00 cfs 1.796 af

Subcatchment2: Subcatchment2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=3.37"
Tc=6.0 min CN=64 Runoff=0.75 cfs 0.056 af

Link DP-1: Reservoir and Swimming Area Inflow=24.00 cfs 1.796 af
Primary=24.00 cfs 1.796 af

Link DP-2: Ditch Inflow=0.75 cfs 0.056 af
Primary=0.75 cfs 0.056 af

Total Runoff Area = 5.416 ac Runoff Volume = 1.852 af Average Runoff Depth = 4.10"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

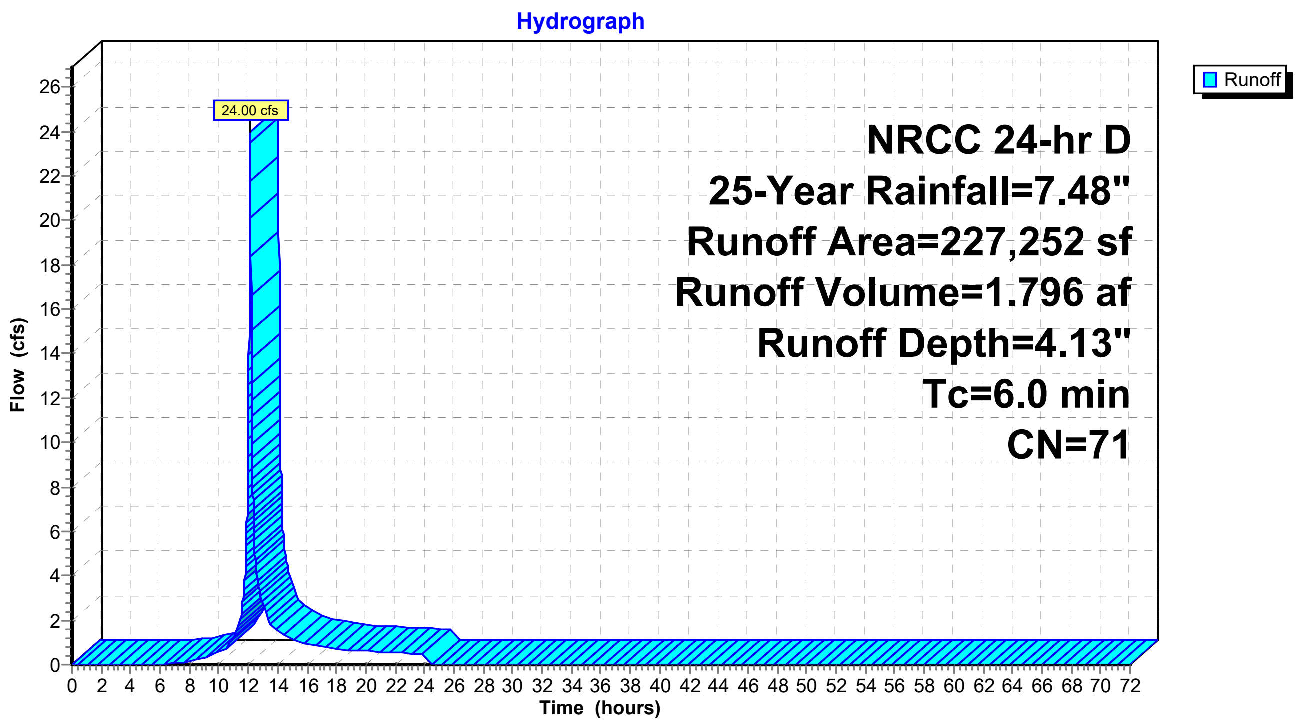
Runoff = 24.00 cfs @ 12.13 hrs, Volume= 1.796 af, Depth= 4.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=7.48"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

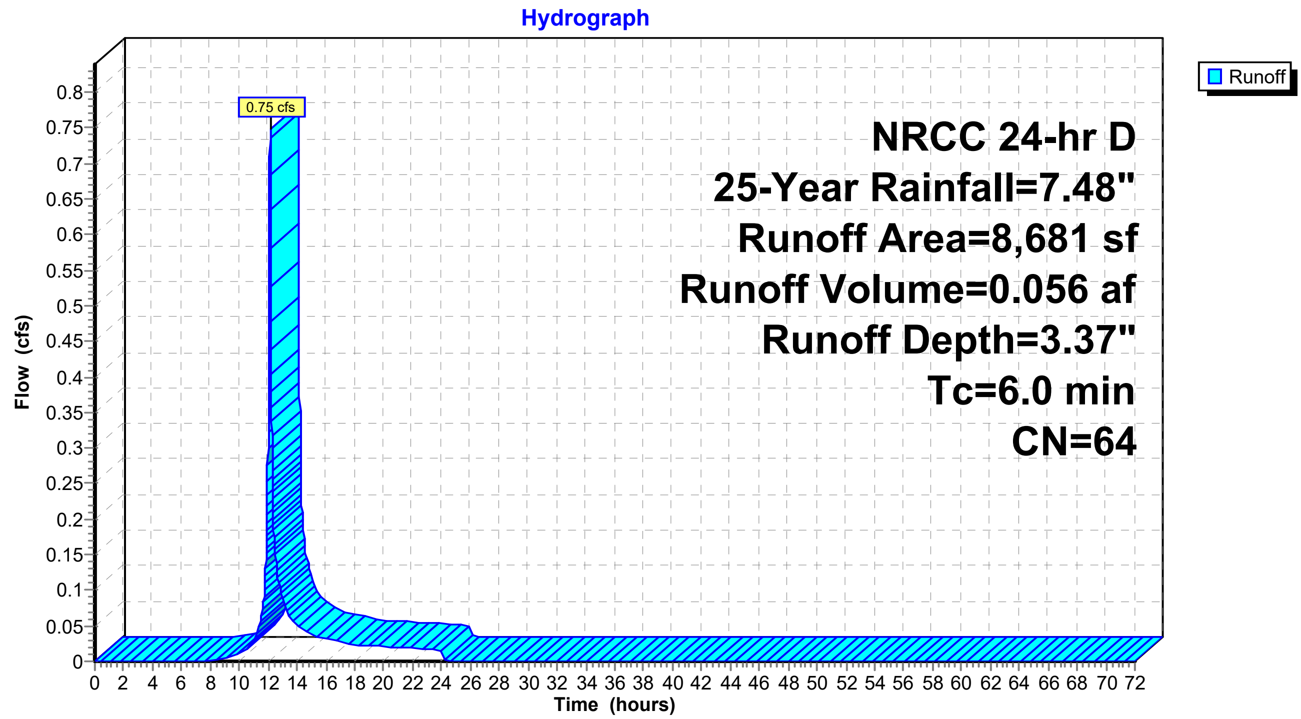
Runoff = 0.75 cfs @ 12.13 hrs, Volume= 0.056 af, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=7.48"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

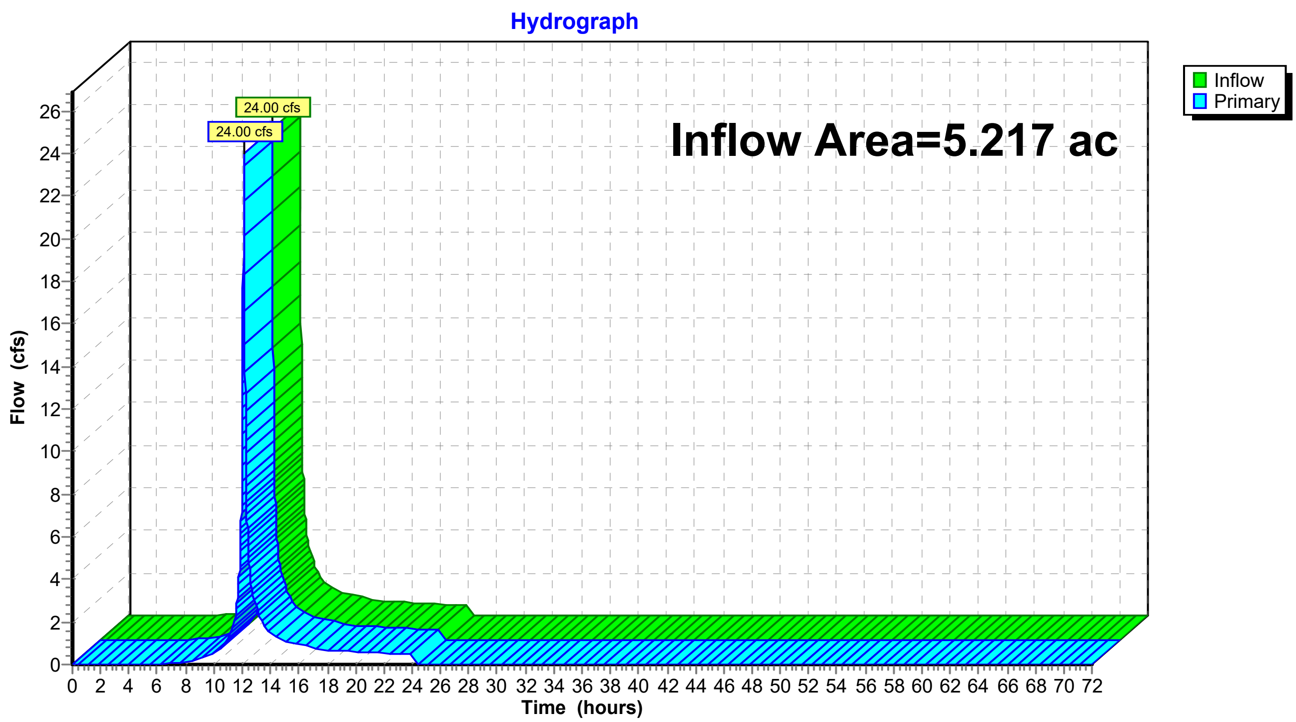


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.217 ac, 38.51% Impervious, Inflow Depth = 4.13" for 25-Year event
Inflow = 24.00 cfs @ 12.13 hrs, Volume= 1.796 af
Primary = 24.00 cfs @ 12.13 hrs, Volume= 1.796 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

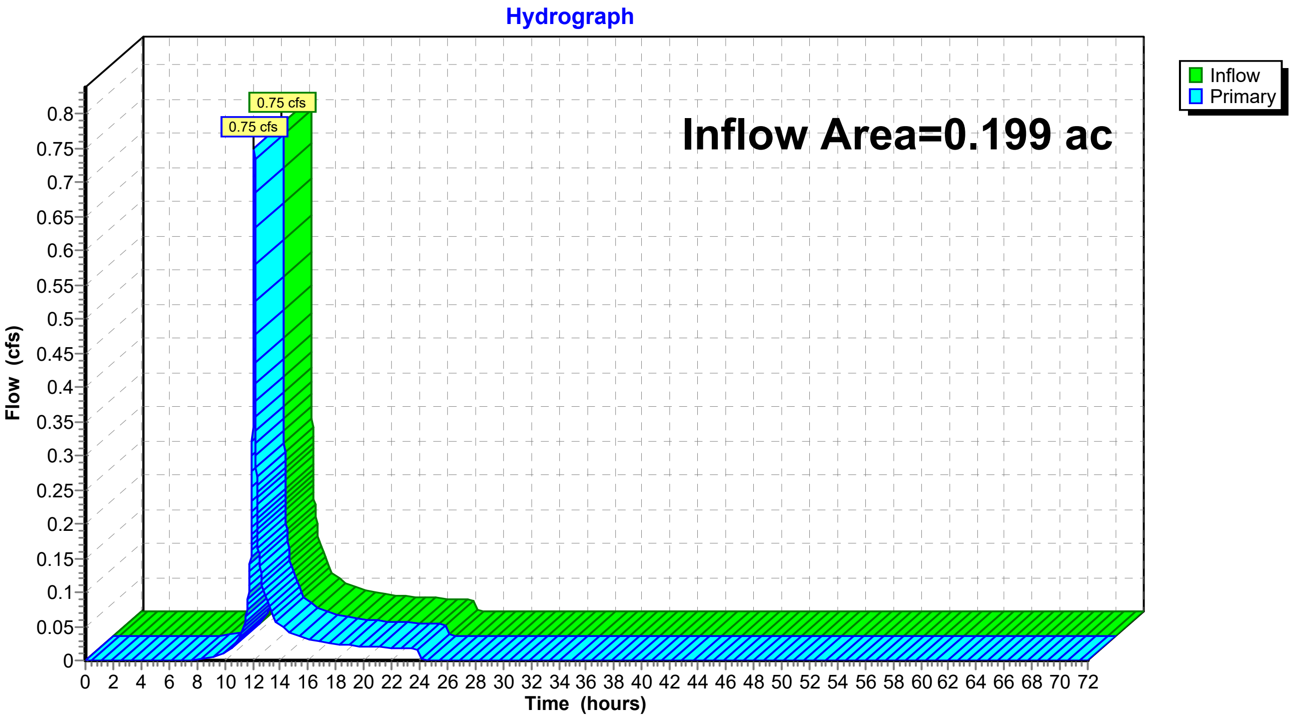


Summary for Link DP-2: Ditch

Inflow Area = 0.199 ac, 39.47% Impervious, Inflow Depth = 3.37" for 25-Year event
Inflow = 0.75 cfs @ 12.13 hrs, Volume= 0.056 af
Primary = 0.75 cfs @ 12.13 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcatchment1 Runoff Area=227,252 sf 38.51% Impervious Runoff Depth=6.67"
Tc=6.0 min CN=71 Runoff=38.24 cfs 2.901 af

Subcatchment2: Subcatchment2 Runoff Area=8,681 sf 39.47% Impervious Runoff Depth=5.73"
Tc=6.0 min CN=64 Runoff=1.27 cfs 0.095 af

Link DP-1: Reservoir and Swimming Area Inflow=38.24 cfs 2.901 af
Primary=38.24 cfs 2.901 af

Link DP-2: Ditch Inflow=1.27 cfs 0.095 af
Primary=1.27 cfs 0.095 af

Total Runoff Area = 5.416 ac Runoff Volume = 2.997 af Average Runoff Depth = 6.64"
61.46% Pervious = 3.329 ac 38.54% Impervious = 2.088 ac

Summary for Subcatchment 1: Subcatchment 1

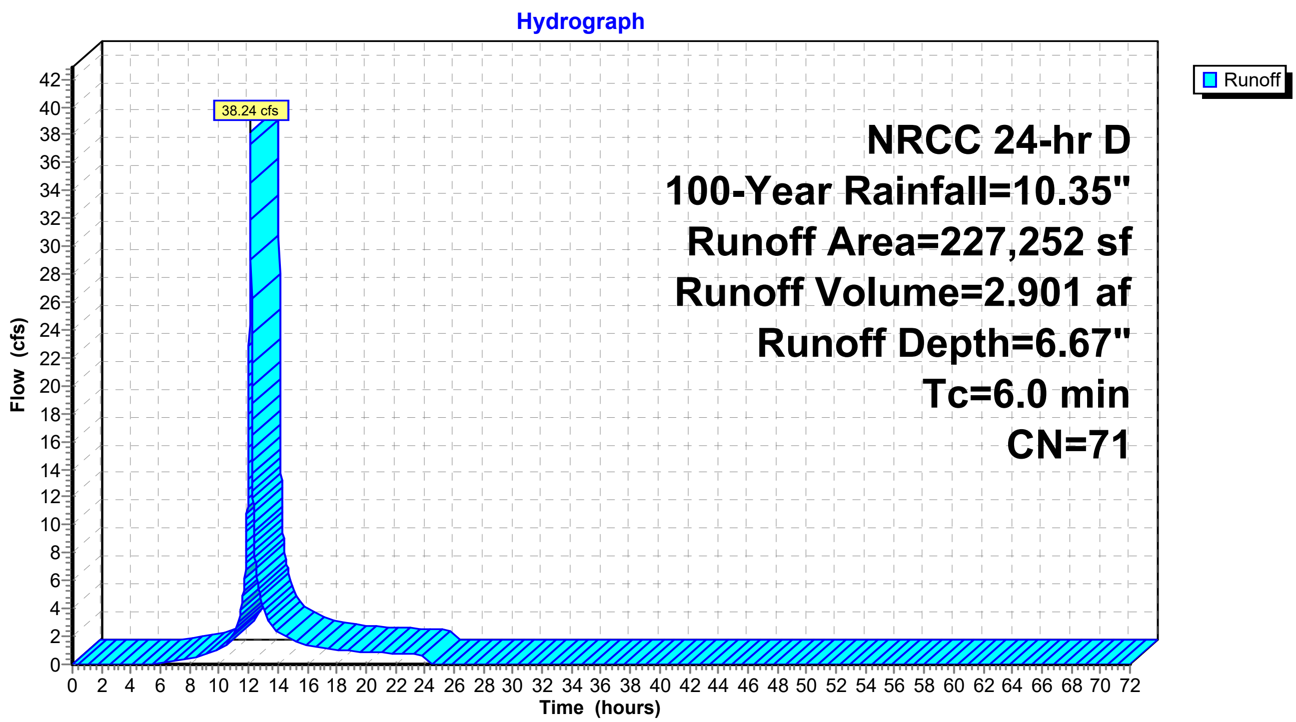
Runoff = 38.24 cfs @ 12.13 hrs, Volume= 2.901 af, Depth= 6.67"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=10.35"

	Area (sf)	CN	Description
	14,435	30	Brush, Good, HSG A
*	57,370	63	Beach Sand, HSG A
*	1,998	96	Dense Sand Path, HSG A
	63,530	49	50-75% Grass cover, Fair, HSG A
*	24,927	98	Gravel parking, HSG A
*	9,994	98	Impervious Surface, HSG A
	52,585	98	Water Surface, HSG A
*	2,413	39	Open Space, Good, HSG A (>75% Grass Cover)
	227,252	71	Weighted Average
	139,746		61.49% Pervious Area
	87,506		38.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Subcatchment 1



Summary for Subcatchment 2: Subcatchment 2

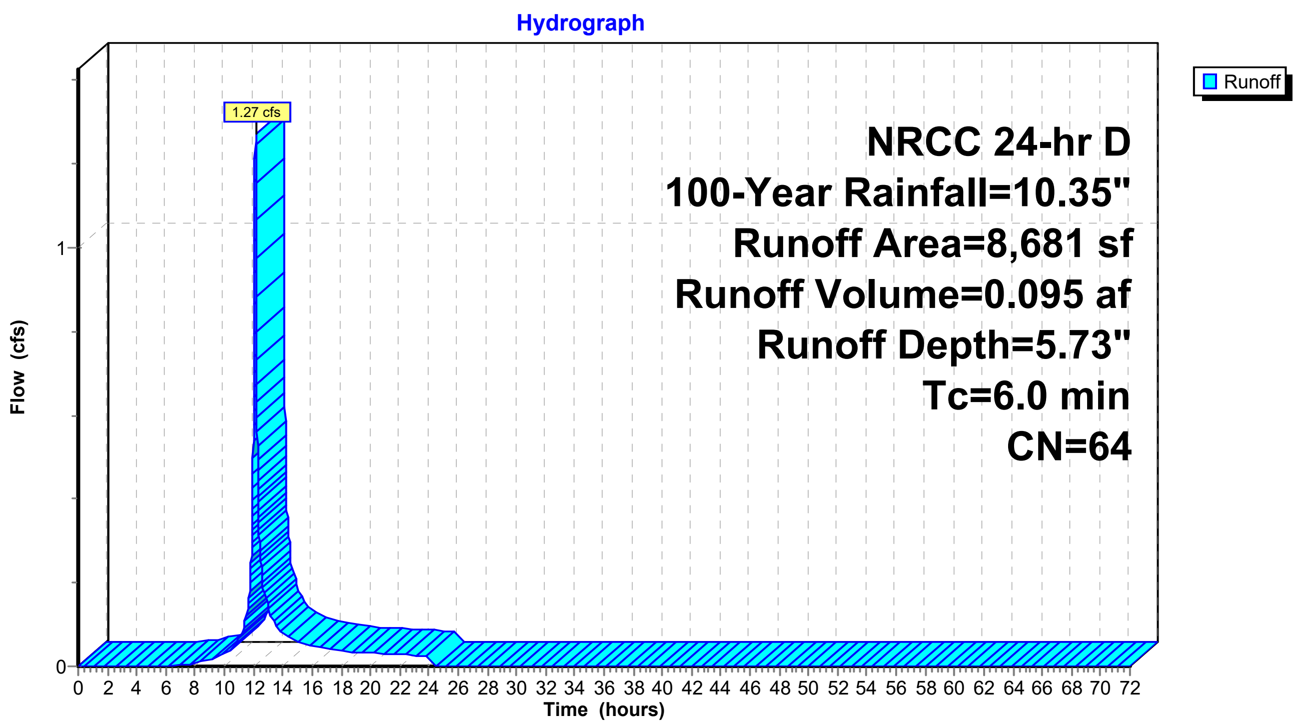
Runoff = 1.27 cfs @ 12.13 hrs, Volume= 0.095 af, Depth= 5.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=10.35"

	Area (sf)	CN	Description
	2,076	30	Brush, Good, HSG A
	3,179	49	50-75% Grass cover, Fair, HSG A
*	3,211	98	Gravel parking, HSG A
	215	98	Impervious Surface, HSG A
	8,681	64	Weighted Average
	5,255		60.53% Pervious Area
	3,426		39.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2

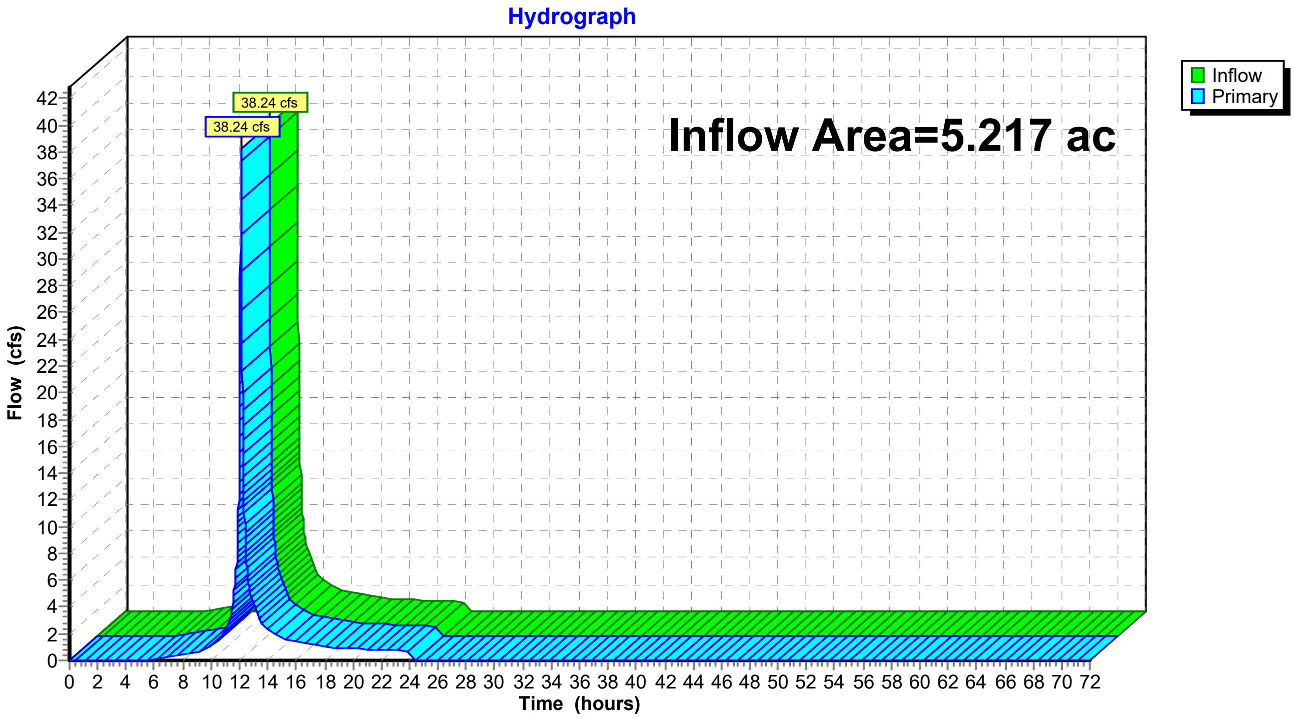


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.217 ac, 38.51% Impervious, Inflow Depth = 6.67" for 100-Year event			
Inflow =	38.24 cfs @	12.13 hrs, Volume=	2.901 af	
Primary =	38.24 cfs @	12.13 hrs, Volume=	2.901 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

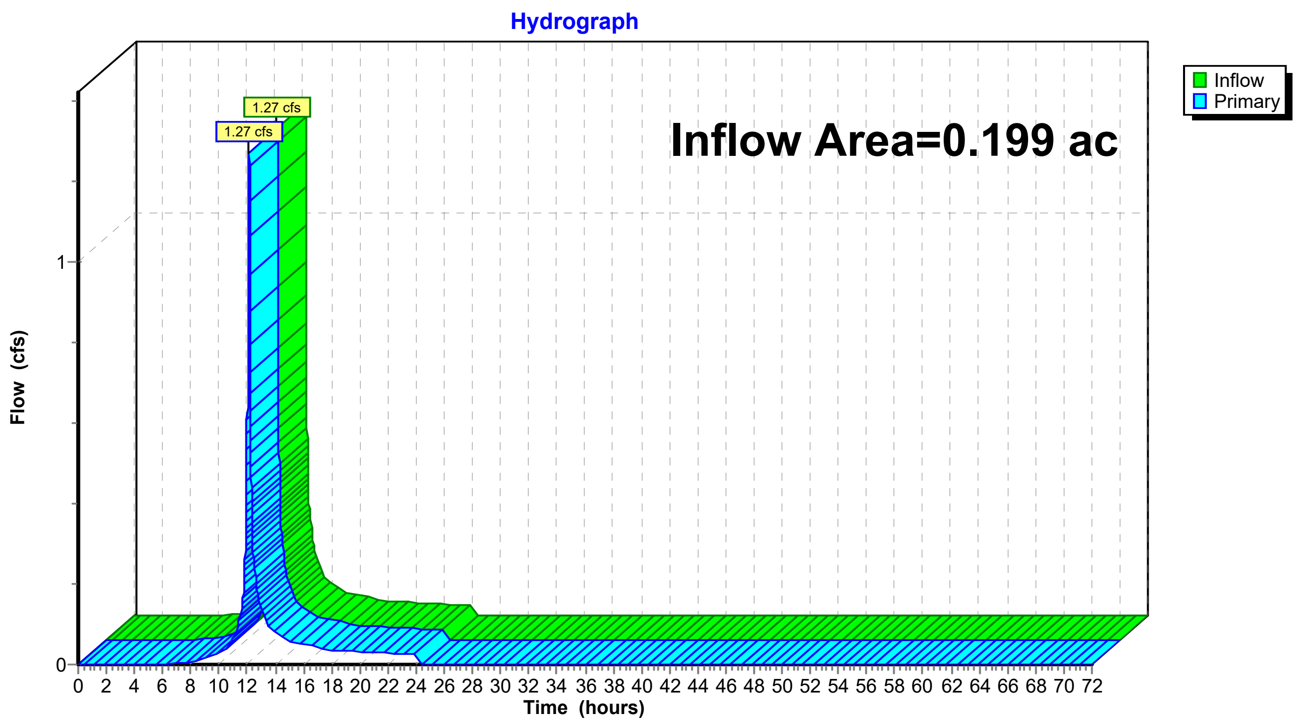


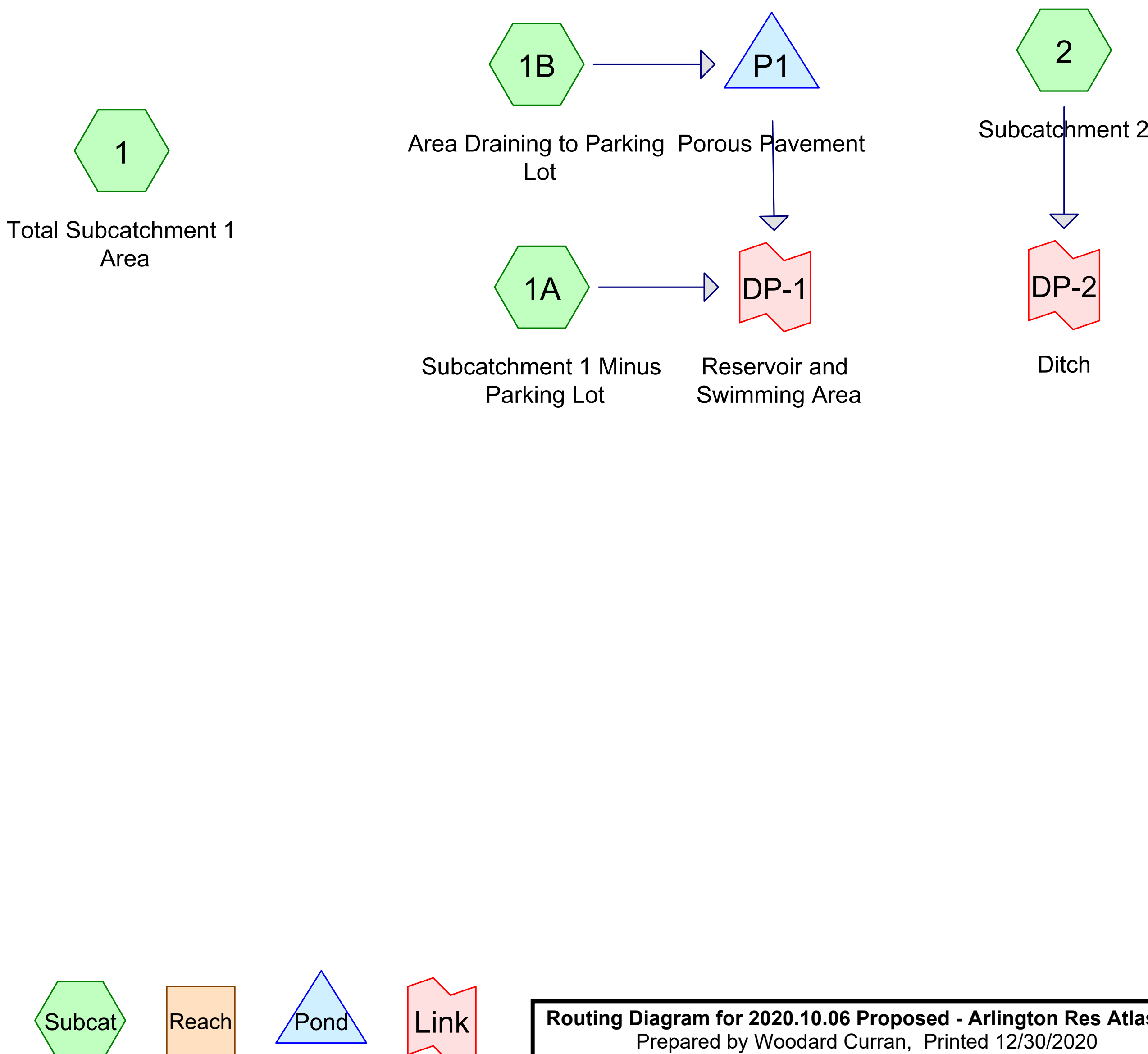
Summary for Link DP-2: Ditch

Inflow Area = 0.199 ac, 39.47% Impervious, Inflow Depth = 5.73" for 100-Year event
Inflow = 1.27 cfs @ 12.13 hrs, Volume= 0.095 af
Primary = 1.27 cfs @ 12.13 hrs, Volume= 0.095 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch





Routing Diagram for 2020.10.06 Proposed - Arlington Res Atlas Plus
Prepared by Woodard Curran, Printed 12/30/2020
HydroCAD® 10.00-21 s/n 01204 © 2018 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.052	39	>75% Grass cover, Good, HSG A (1, 1A, 1B, 2)
2.058	63	Beach Sand, HSG A (1, 1A)
0.608	30	Brush, Good, HSG A (1, 1A)
0.934	98	Impervious Surface, HSG A (1, 1A, 1B)
0.184	39	Permeable Playground Surface, Good, HSG A (1A)
0.184	39	Permeable Playground Surfaces, Good, HSG A (1)
1.042	98	Porous Pavement, HSG A (1, 1A, 1B)
0.276	96	Stone Dust, HSG A (1, 1A)
2.401	98	Water Surface, HSG A (1, 1A)
10.738	**69**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
10.738	HSG A	1, 1A, 1B, 2
0.000	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
10.738		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcato Number
3.052	0.000	0.000	0.000	0.000	3.052	>75% Grass cover, Good	
2.058	0.000	0.000	0.000	0.000	2.058	Beach Sand	
0.608	0.000	0.000	0.000	0.000	0.608	Brush, Good	
0.934	0.000	0.000	0.000	0.000	0.934	Impervious Surface	
0.184	0.000	0.000	0.000	0.000	0.184	Permeable Playground Surface, Good	
0.184	0.000	0.000	0.000	0.000	0.184	Permeable Playground Surfaces, Good	
1.042	0.000	0.000	0.000	0.000	1.042	Porous Pavement	
0.276	0.000	0.000	0.000	0.000	0.276	Stone Dust	
2.401	0.000	0.000	0.000	0.000	2.401	Water Surface	
10.738	**0.000**	**0.000**	**0.000**	**0.000**	**10.738**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	P1	162.15	162.05	20.0	0.0050	0.013	12.0	0.0	0.0

Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Total Subcatchment1 Runoff Area=231,818 sf 41.12% Impervious Runoff Depth=0.63"
Tc=6.0 min CN=69 Runoff=3.32 cfs 0.281 af

Subcatchment1A: Subcatchment1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=67 Runoff=2.38 cfs 0.213 af

Subcatchment1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=1.26"
Tc=6.0 min CN=81 Runoff=0.96 cfs 0.072 af

Subcatchment2: Subcatchment2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Pond P1: Porous Pavement Peak Elev=161.40' Storage=0 cf Inflow=0.96 cfs 0.072 af
Discarded=0.96 cfs 0.072 af Primary=0.00 cfs 0.000 af Outflow=0.96 cfs 0.072 af

Link DP-1: Reservoir and Swimming Area Inflow=2.38 cfs 0.213 af
Primary=2.38 cfs 0.213 af

Link DP-2: Ditch Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 10.738 ac Runoff Volume = 0.565 af Average Runoff Depth = 0.63"
59.24% Pervious = 6.362 ac 40.76% Impervious = 4.376 ac

Summary for Subcatchment 1: Total Subcatchment 1 Area

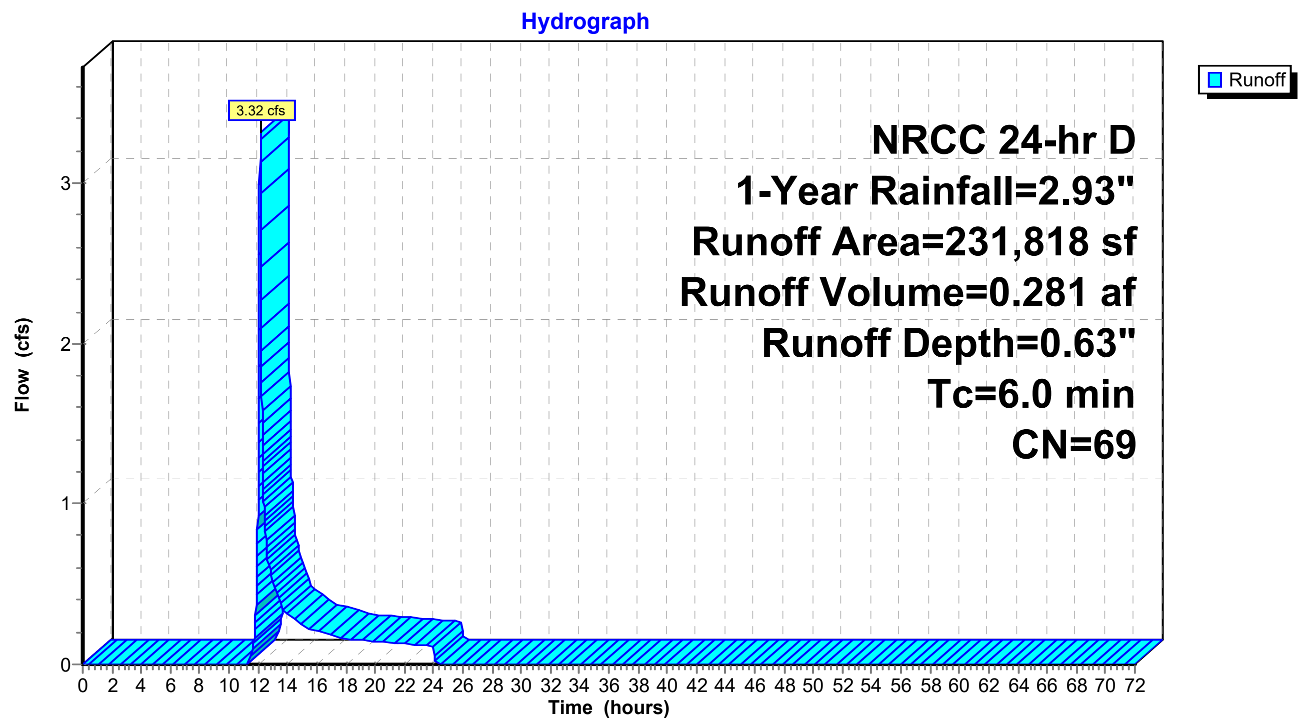
Runoff = 3.32 cfs @ 12.14 hrs, Volume= 0.281 af, Depth= 0.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 1-Year Rainfall=2.93"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	64,412	39	>75% Grass cover, Good, HSG A
	20,338	98	Impervious Surface, HSG A
*	22,688	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surfaces, Good, HSG A
	231,818	69	Weighted Average
	136,500		58.88% Pervious Area
	95,318		41.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Total Subcatchment 1 Area



Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

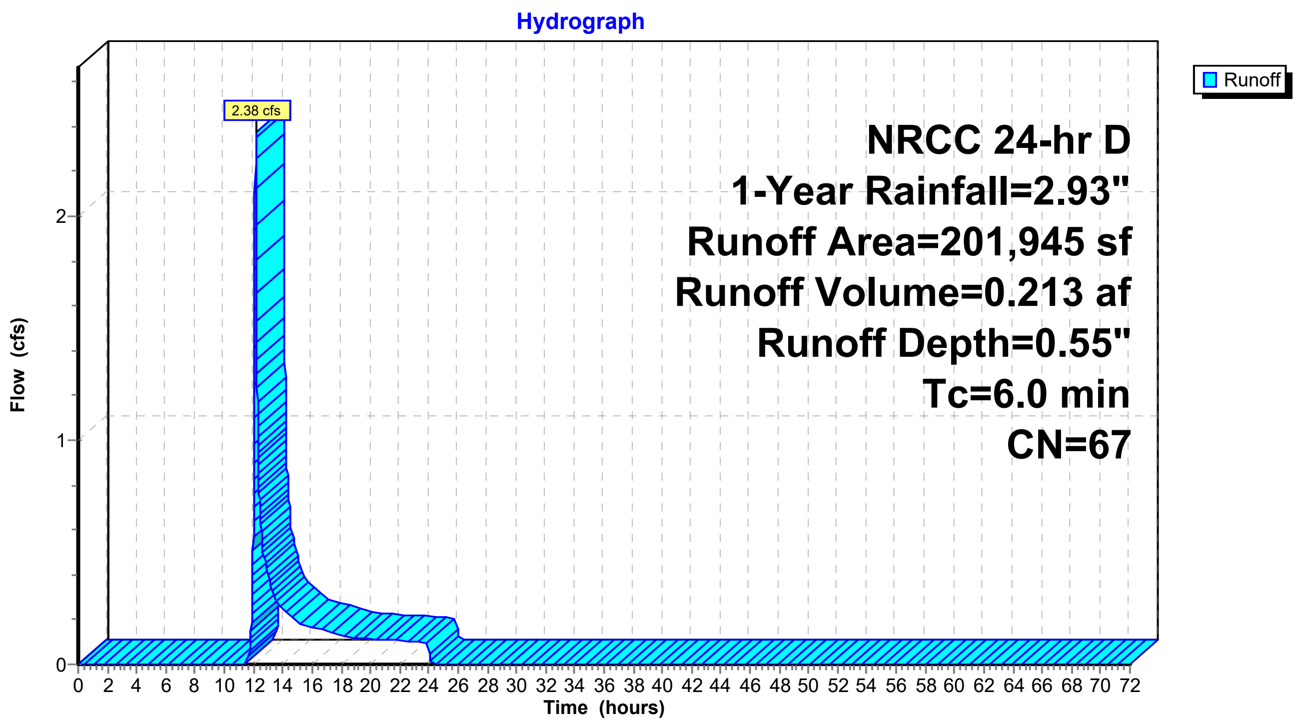
Runoff = 2.38 cfs @ 12.14 hrs, Volume= 0.213 af, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 1-Year Rainfall=2.93"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

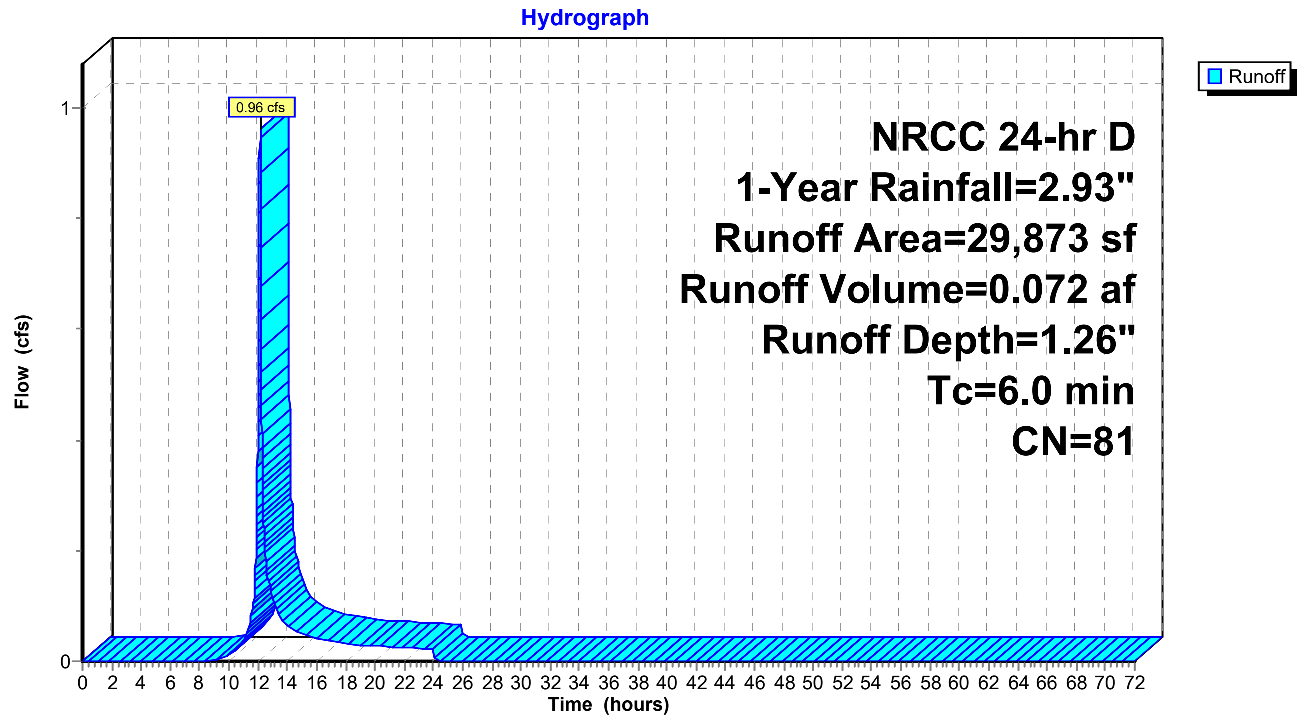
Runoff = 0.96 cfs @ 12.13 hrs, Volume= 0.072 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 1-Year Rainfall=2.93"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

[45] Hint: Runoff=Zero

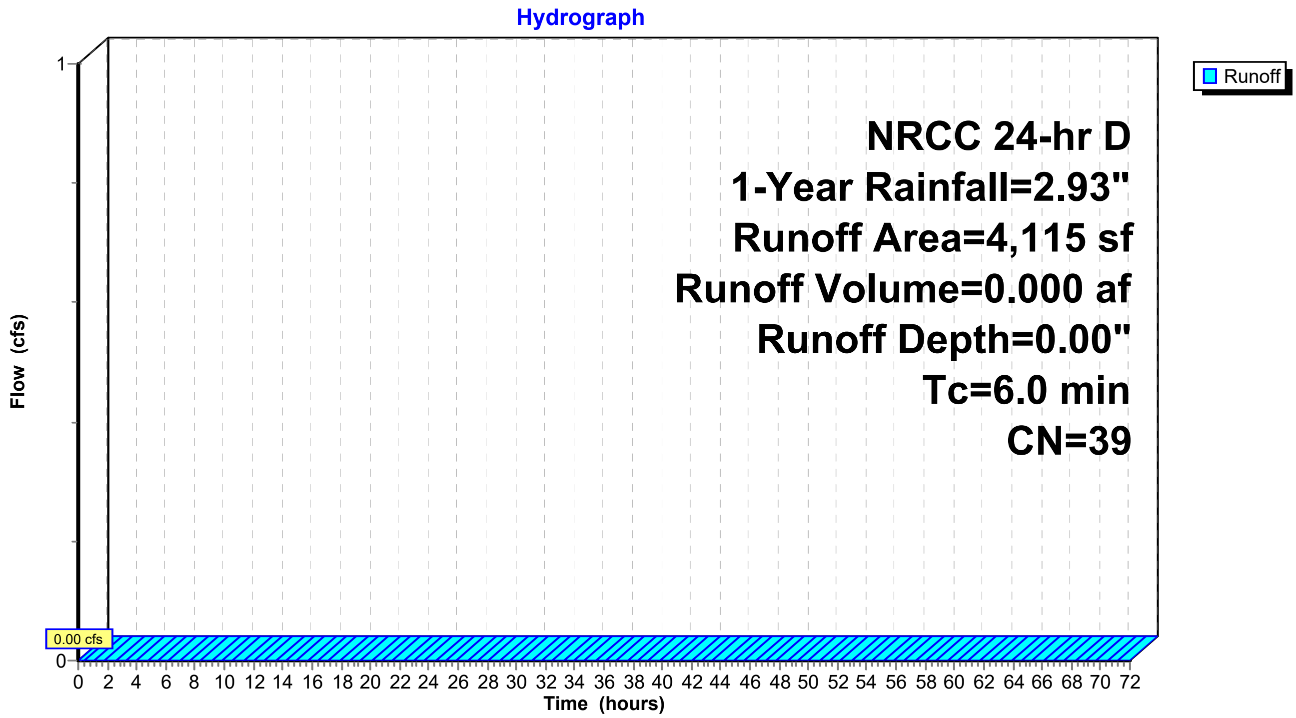
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 1-Year Rainfall=2.93"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 1.26" for 1-Year event
Inflow = 0.96 cfs @ 12.13 hrs, Volume= 0.072 af
Outflow = 0.96 cfs @ 12.13 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.0 min
Discarded = 0.96 cfs @ 12.13 hrs, Volume= 0.072 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.40' @ 12.13 hrs Surf.Area= 21,411 sf Storage= 0 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.0 min (872.1 - 872.1)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

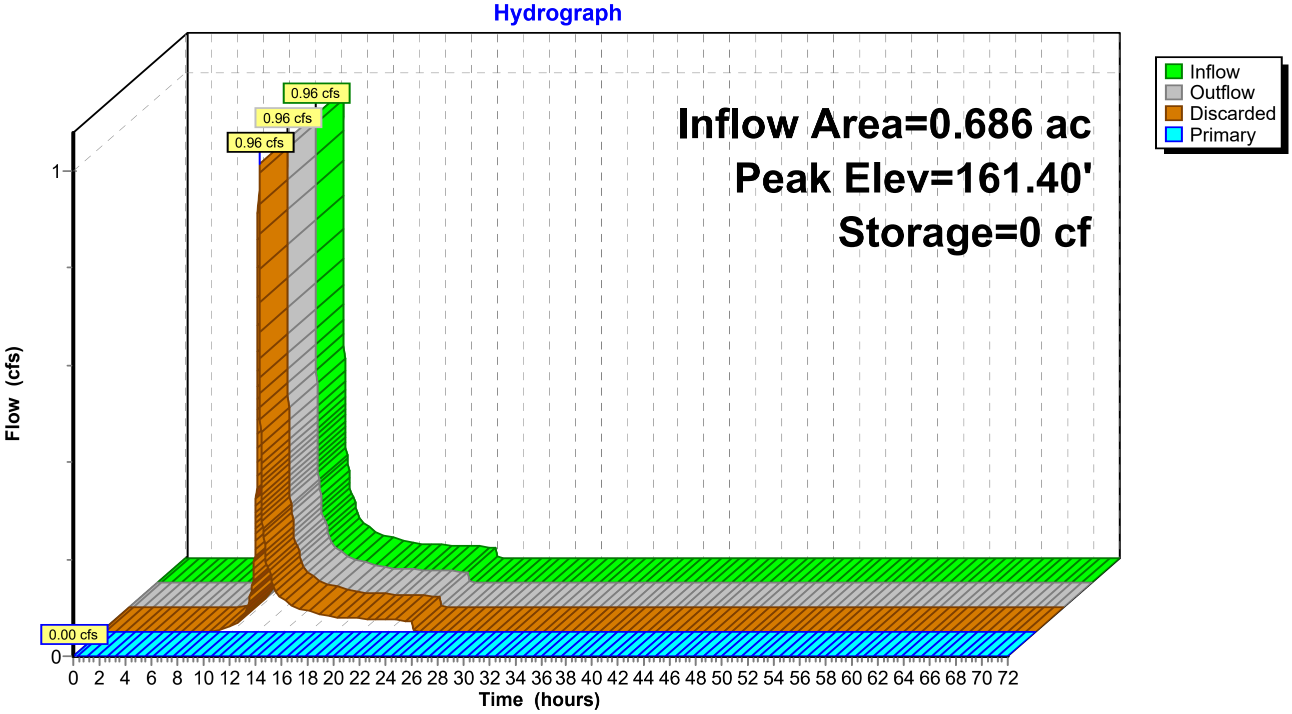
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.13 hrs HW=161.40' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

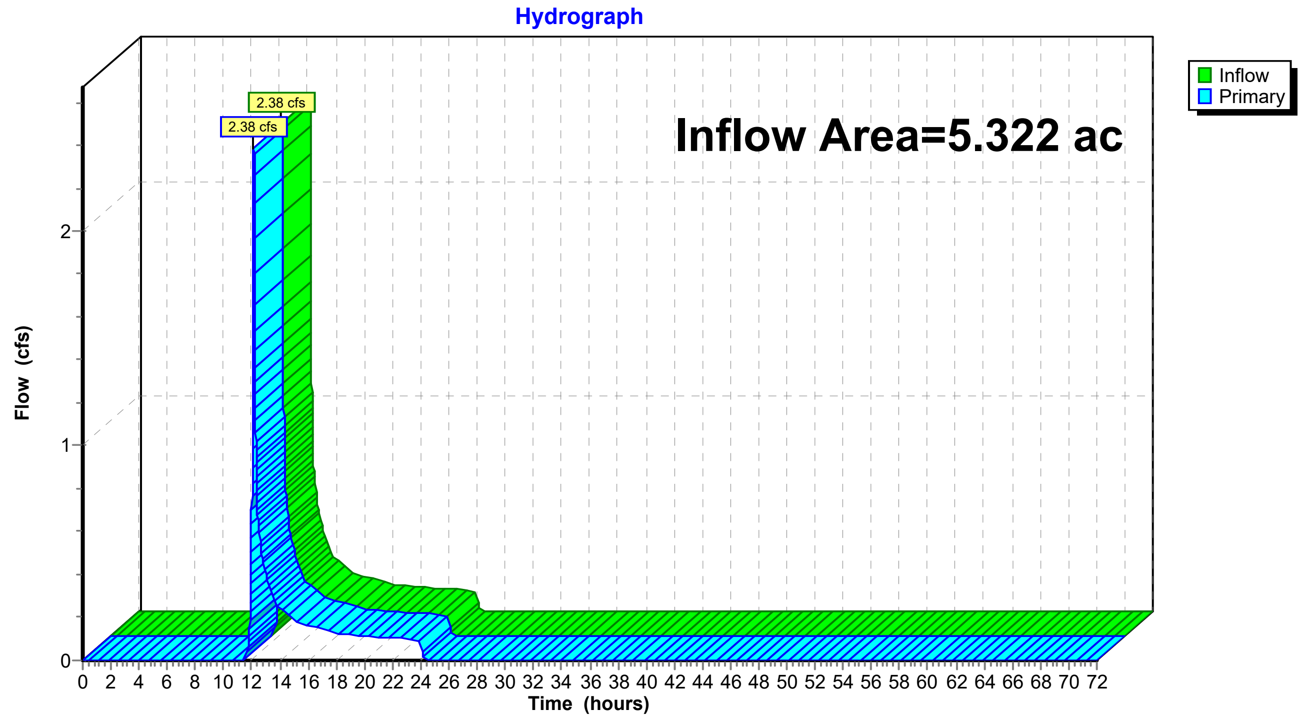


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.322 ac, 41.12% Impervious, Inflow Depth = 0.48" for 1-Year event
Inflow = 2.38 cfs @ 12.14 hrs, Volume= 0.213 af
Primary = 2.38 cfs @ 12.14 hrs, Volume= 0.213 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

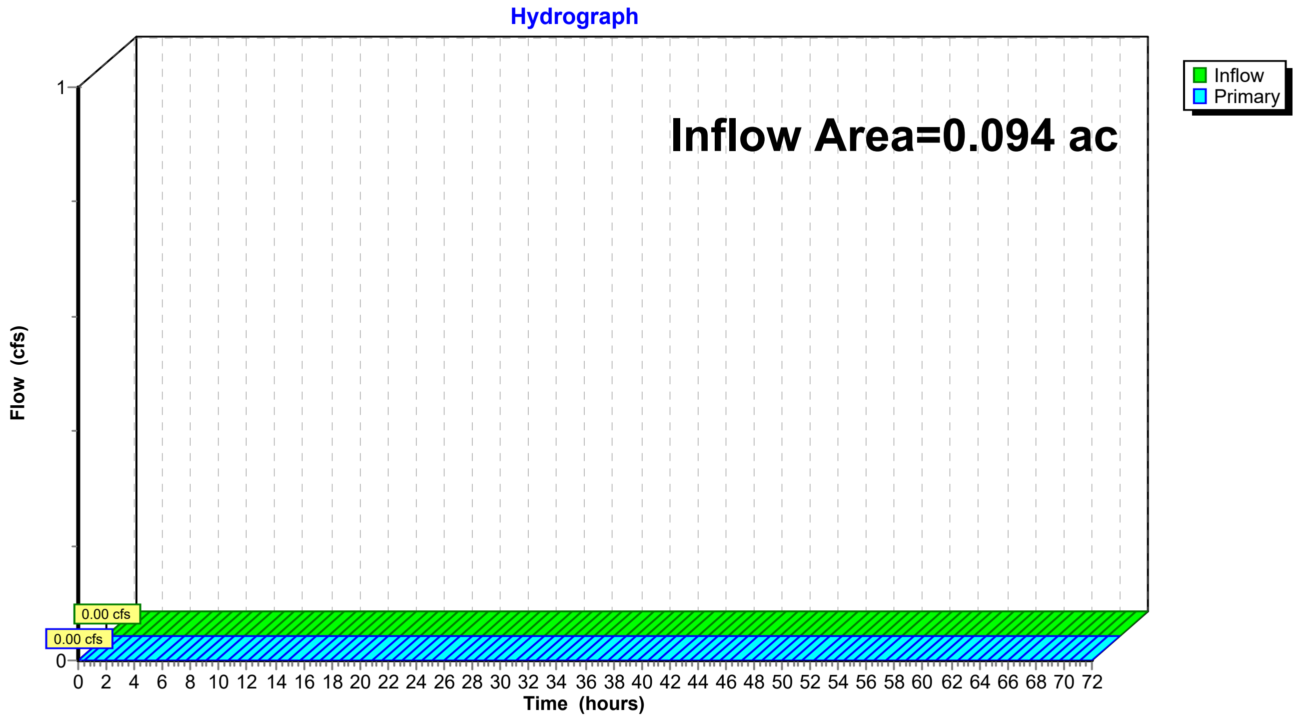


Summary for Link DP-2: Ditch

Inflow Area =	0.094 ac,	0.00% Impervious,	Inflow Depth = 0.00"	for 1-Year event	
Inflow =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af	
Primary =	0.00 cfs @	0.00 hrs,	Volume=	0.000 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Total Subcatchment1 Runoff Area=231,818 sf 41.12% Impervious Runoff Depth=1.04"
Tc=6.0 min CN=69 Runoff=5.88 cfs 0.461 af

Subcatchment1A: Subcatchment1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=67 Runoff=4.47 cfs 0.359 af

Subcatchment1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=1.82"
Tc=6.0 min CN=81 Runoff=1.40 cfs 0.104 af

Subcatchment2: Subcatchment2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.02"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

Pond P1: Porous Pavement Peak Elev=161.40' Storage=37 cf Inflow=1.40 cfs 0.104 af
Discarded=1.19 cfs 0.104 af Primary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.104 af

Link DP-1: Reservoir and Swimming Area Inflow=4.47 cfs 0.359 af
Primary=4.47 cfs 0.359 af

Link DP-2: Ditch Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Total Runoff Area = 10.738 ac Runoff Volume = 0.924 af Average Runoff Depth = 1.03"
59.24% Pervious = 6.362 ac 40.76% Impervious = 4.376 ac

Summary for Subcatchment 1: Total Subcatchment 1 Area

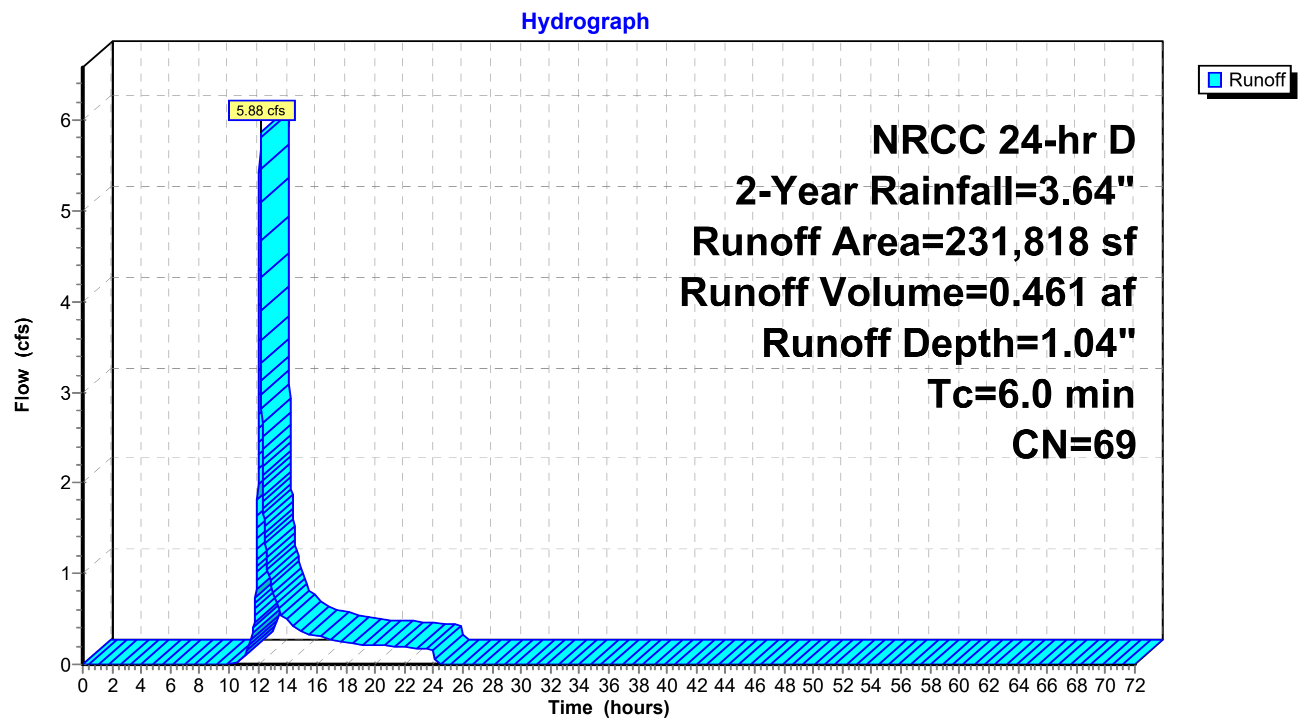
Runoff = 5.88 cfs @ 12.14 hrs, Volume= 0.461 af, Depth= 1.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.64"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	64,412	39	>75% Grass cover, Good, HSG A
	20,338	98	Impervious Surface, HSG A
*	22,688	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surfaces, Good, HSG A
	231,818	69	Weighted Average
	136,500		58.88% Pervious Area
	95,318		41.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Total Subcatchment 1 Area



Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

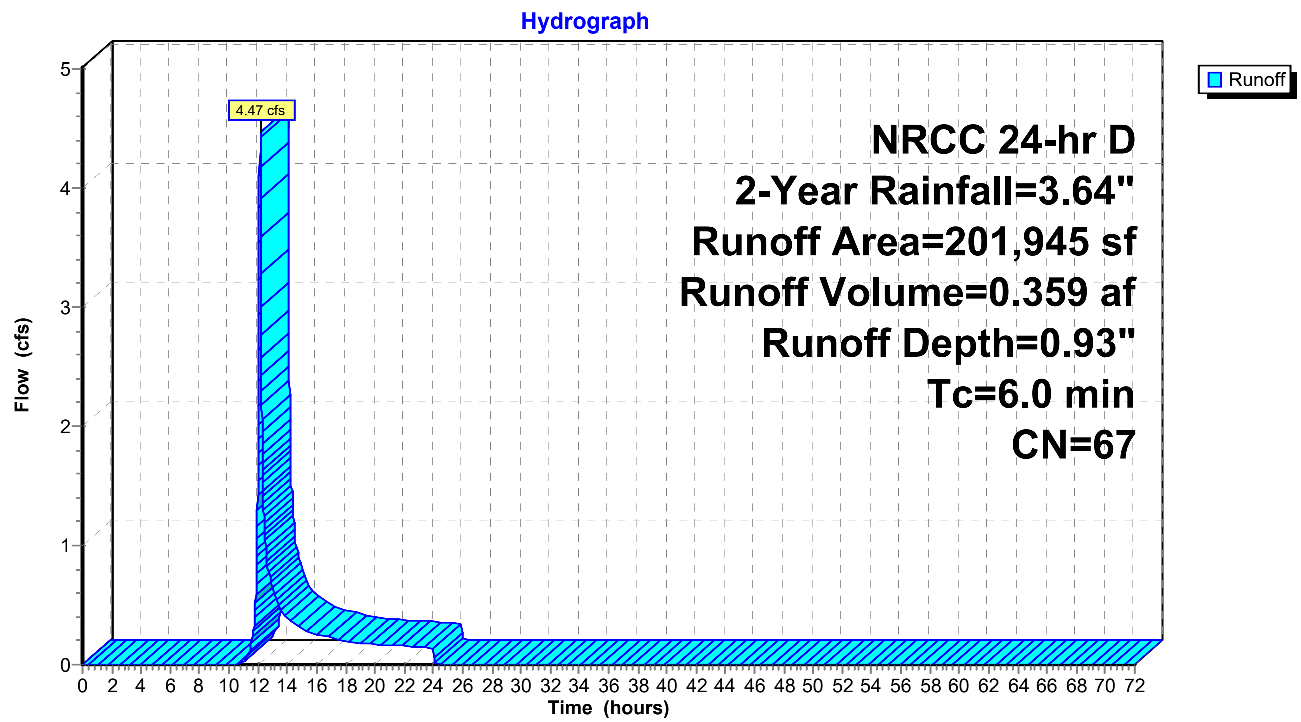
Runoff = 4.47 cfs @ 12.14 hrs, Volume= 0.359 af, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.64"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

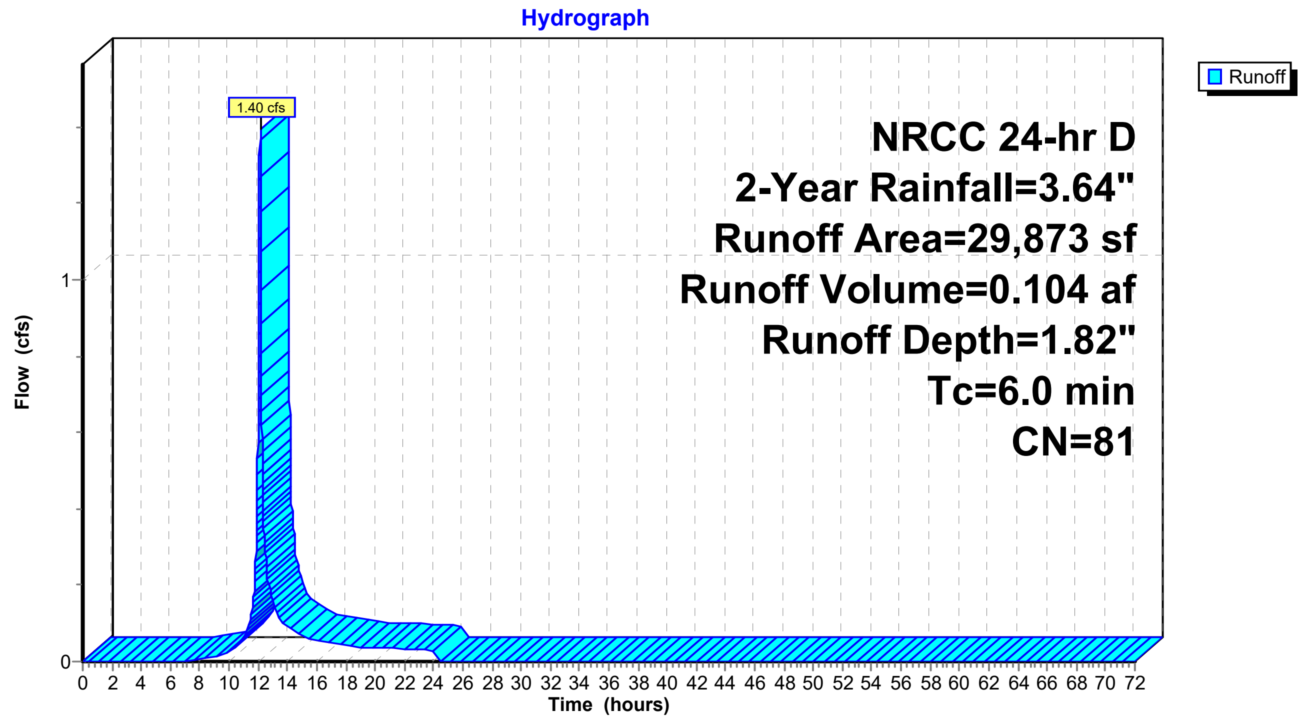
Runoff = 1.40 cfs @ 12.13 hrs, Volume= 0.104 af, Depth= 1.82"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.64"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

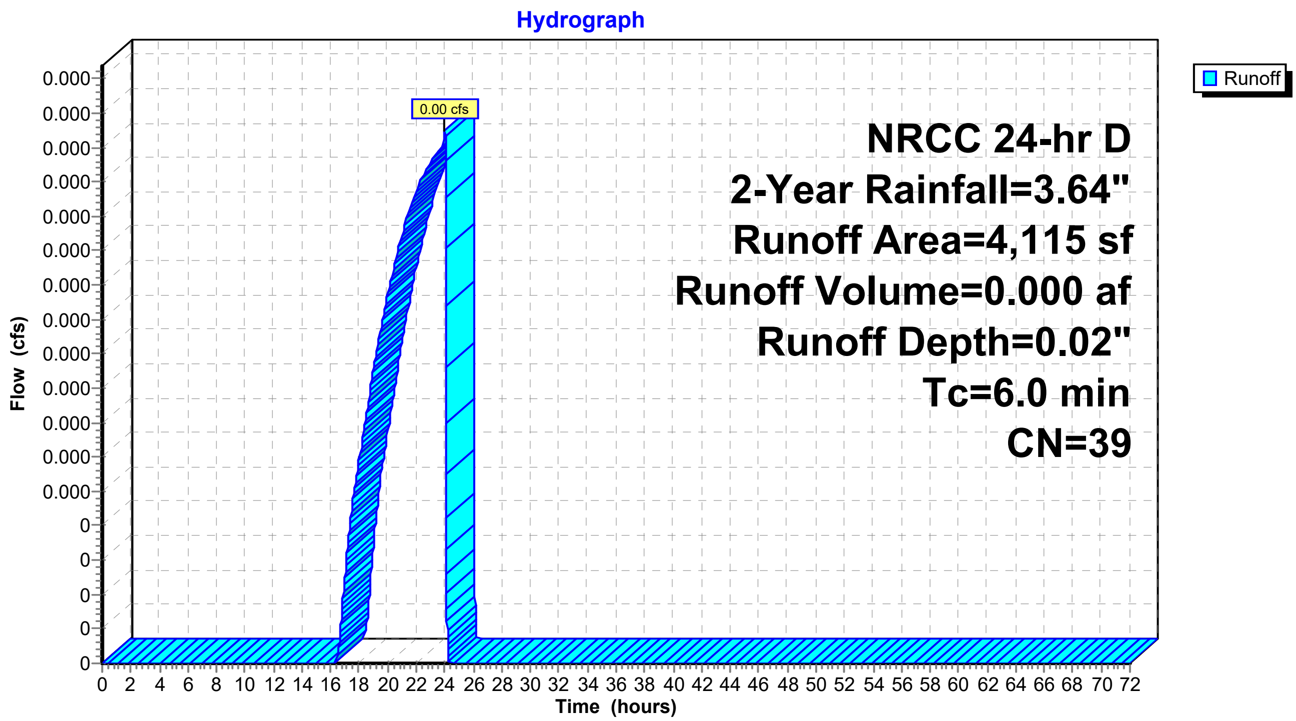
Runoff = 0.00 cfs @ 24.01 hrs, Volume= 0.000 af, Depth= 0.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 2-Year Rainfall=3.64"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=595)

Inflow Area =	0.686 ac, 71.84% Impervious, Inflow Depth = 1.82"	for 2-Year event	
Inflow =	1.40 cfs @ 12.13 hrs, Volume=	0.104 af	
Outflow =	1.19 cfs @ 12.16 hrs, Volume=	0.104 af,	Atten= 14%, Lag= 1.4 min
Discarded =	1.19 cfs @ 12.16 hrs, Volume=	0.104 af	
Primary =	0.00 cfs @ 0.00 hrs, Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.40' @ 12.17 hrs Surf.Area= 21,411 sf Storage= 37 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 0.1 min (858.5 - 858.4)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

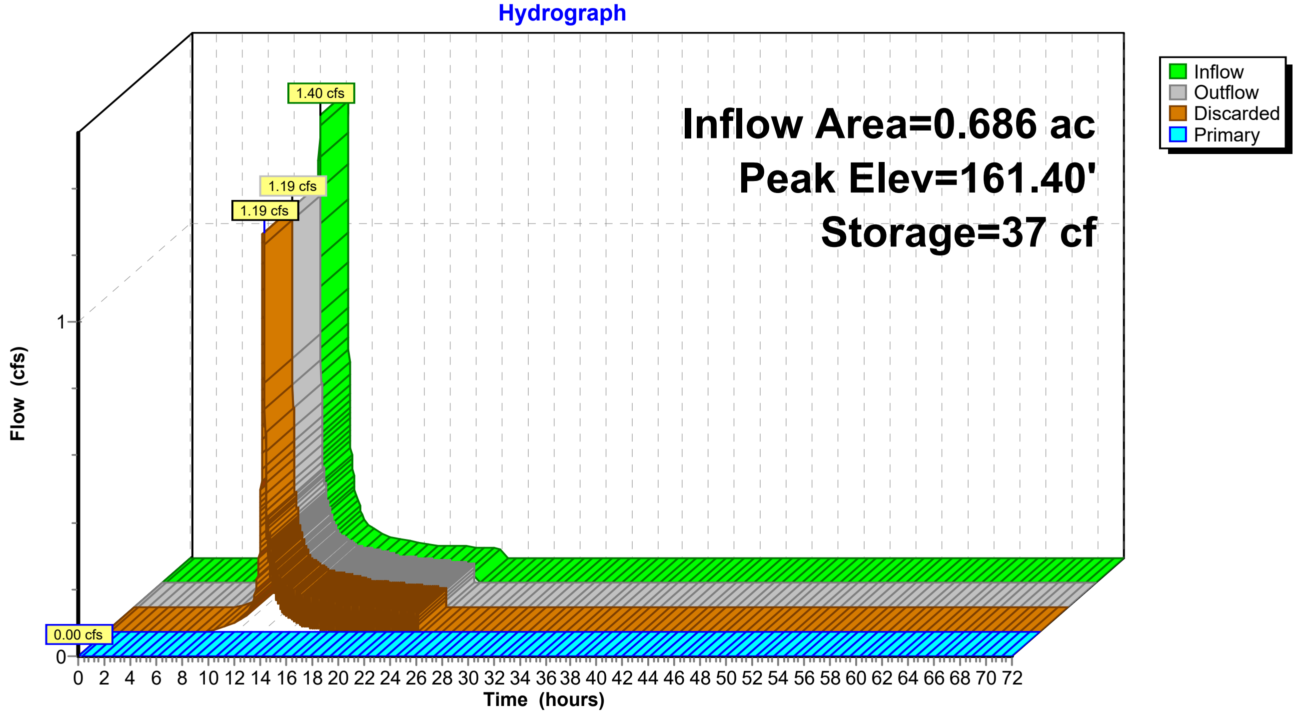
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.16 hrs HW=161.40' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

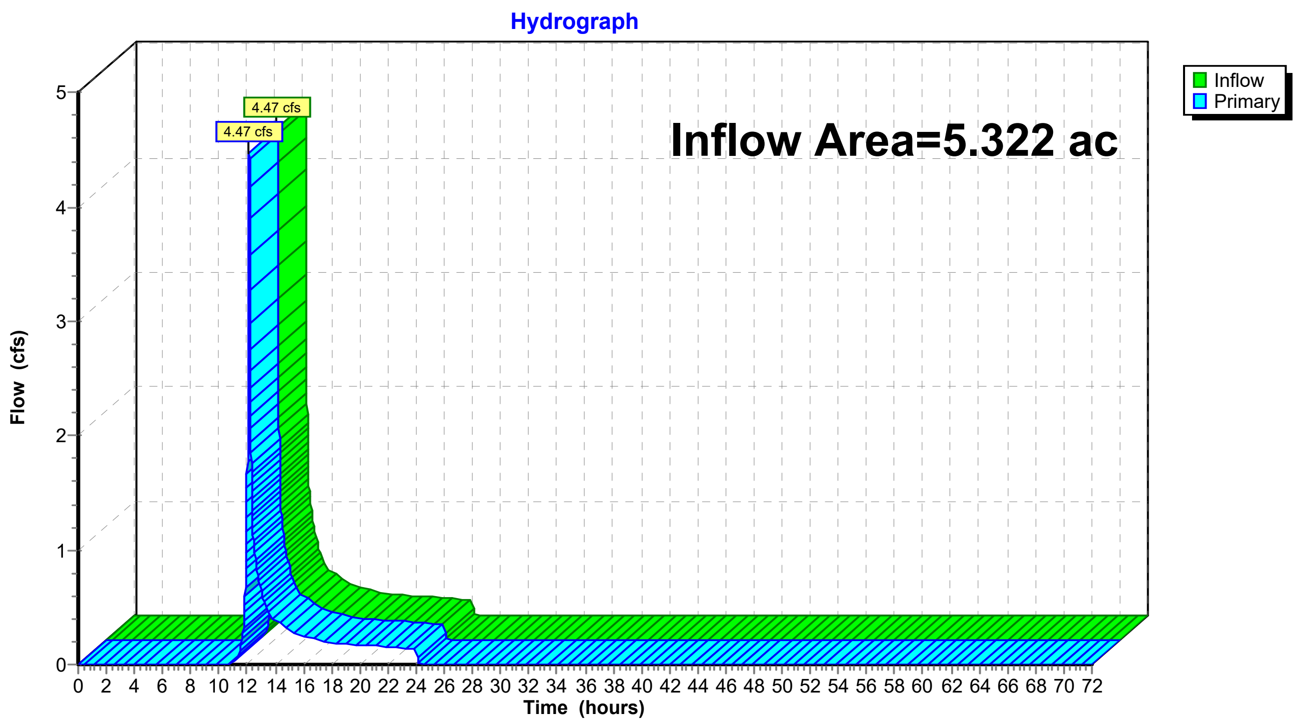


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.322 ac, 41.12% Impervious,	Inflow Depth = 0.81"	for 2-Year event	
Inflow =	4.47 cfs @	12.14 hrs, Volume=	0.359 af	
Primary =	4.47 cfs @	12.14 hrs, Volume=	0.359 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

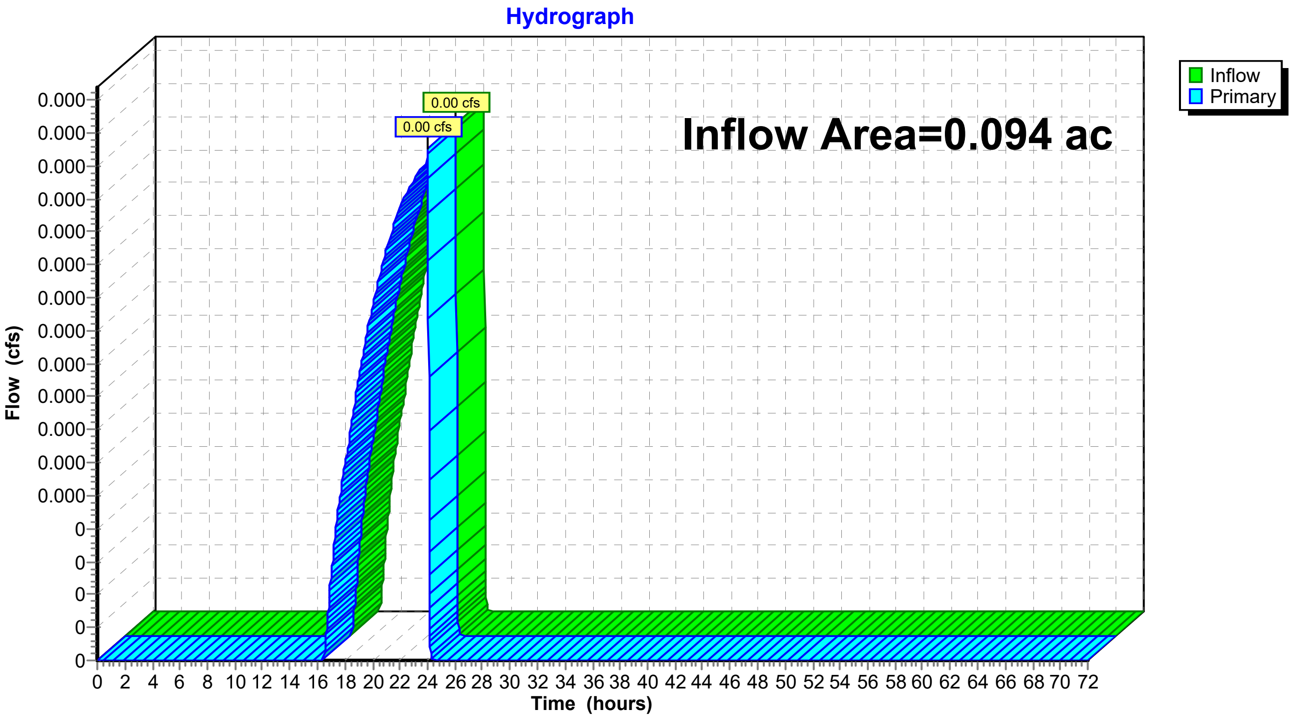


Summary for Link DP-2: Ditch

Inflow Area =	0.094 ac,	0.00% Impervious, Inflow Depth = 0.02"	for 2-Year event
Inflow =	0.00 cfs @	24.01 hrs, Volume=	0.000 af
Primary =	0.00 cfs @	24.01 hrs, Volume=	0.000 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Total Subcatchment1 Runoff Area=231,818 sf 41.12% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=69 Runoff=15.13 cfs 1.131 af

Subcatchment1A: Subcatchment1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=2.37"
Tc=6.0 min CN=67 Runoff=12.22 cfs 0.917 af

Subcatchment1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=3.69"
Tc=6.0 min CN=81 Runoff=2.79 cfs 0.211 af

Subcatchment2: Subcatchment2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.39"
Tc=6.0 min CN=39 Runoff=0.01 cfs 0.003 af

Pond P1: Porous Pavement Peak Elev=161.49' Storage=748 cf Inflow=2.79 cfs 0.211 af
Discarded=1.19 cfs 0.211 af Primary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.211 af

Link DP-1: Reservoir and Swimming Area Inflow=12.22 cfs 0.917 af
Primary=12.22 cfs 0.917 af

Link DP-2: Ditch Inflow=0.01 cfs 0.003 af
Primary=0.01 cfs 0.003 af

Total Runoff Area = 10.738 ac Runoff Volume = 2.261 af Average Runoff Depth = 2.53"
59.24% Pervious = 6.362 ac 40.76% Impervious = 4.376 ac

Summary for Subcatchment 1: Total Subcatchment 1 Area

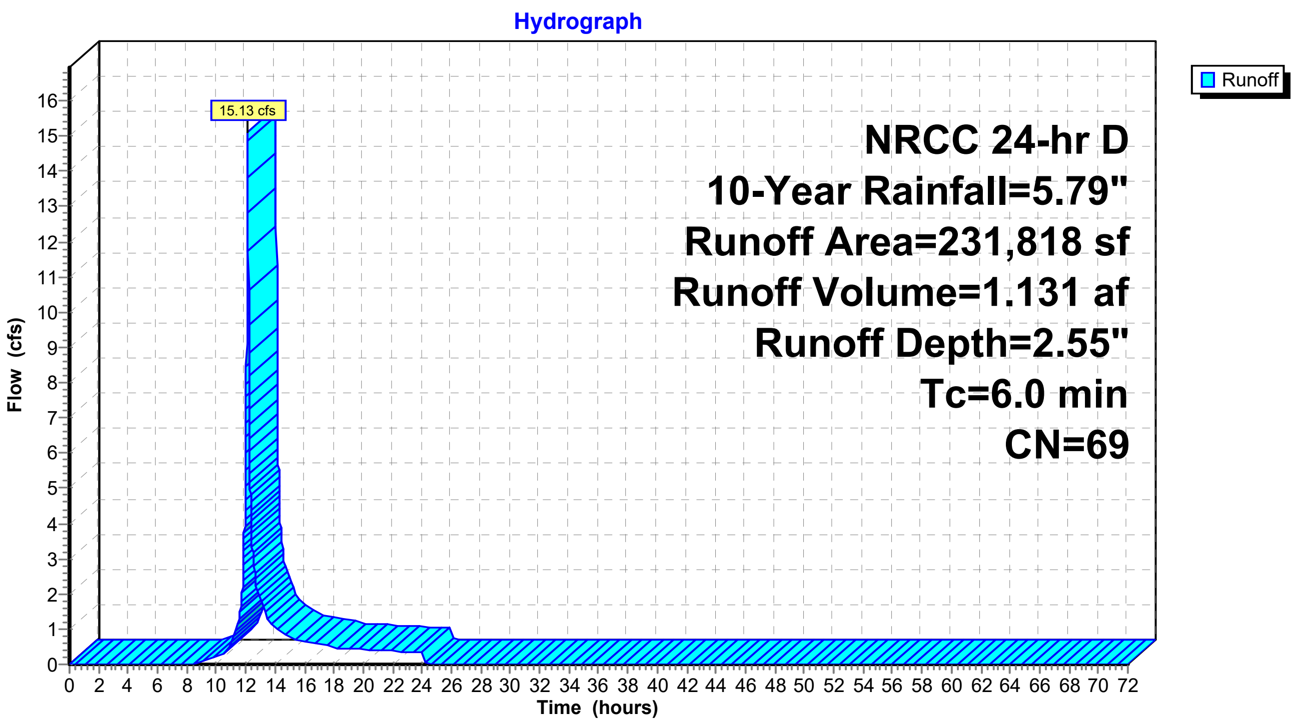
Runoff = 15.13 cfs @ 12.13 hrs, Volume= 1.131 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=5.79"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	64,412	39	>75% Grass cover, Good, HSG A
	20,338	98	Impervious Surface, HSG A
*	22,688	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surfaces, Good, HSG A
	231,818	69	Weighted Average
	136,500		58.88% Pervious Area
	95,318		41.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Total Subcatchment 1 Area



Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

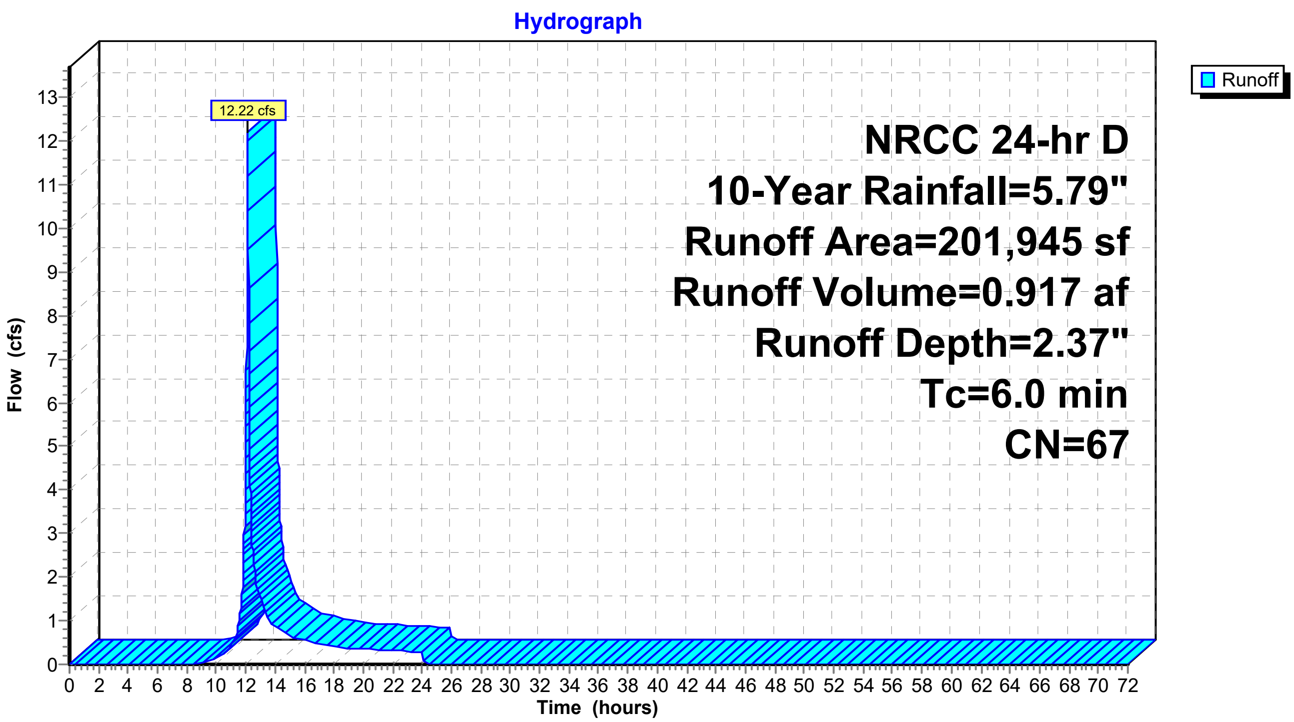
Runoff = 12.22 cfs @ 12.13 hrs, Volume= 0.917 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=5.79"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

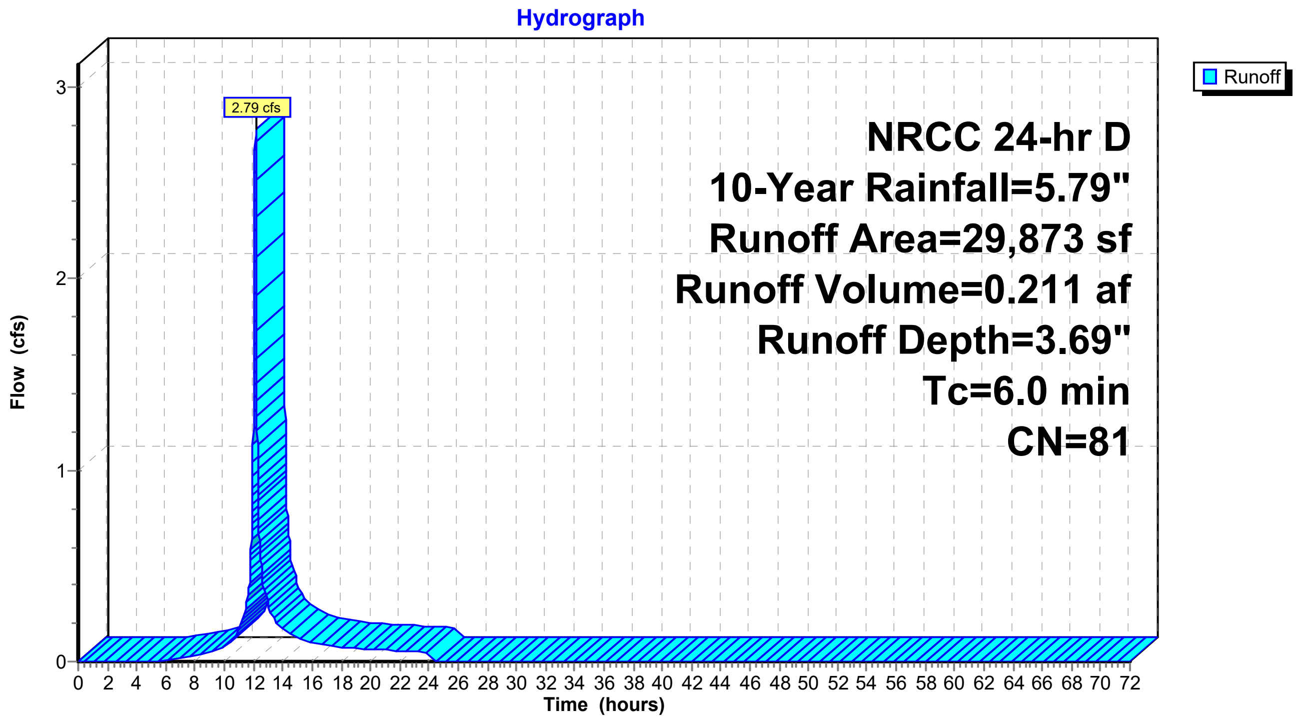
Runoff = 2.79 cfs @ 12.13 hrs, Volume= 0.211 af, Depth= 3.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=5.79"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

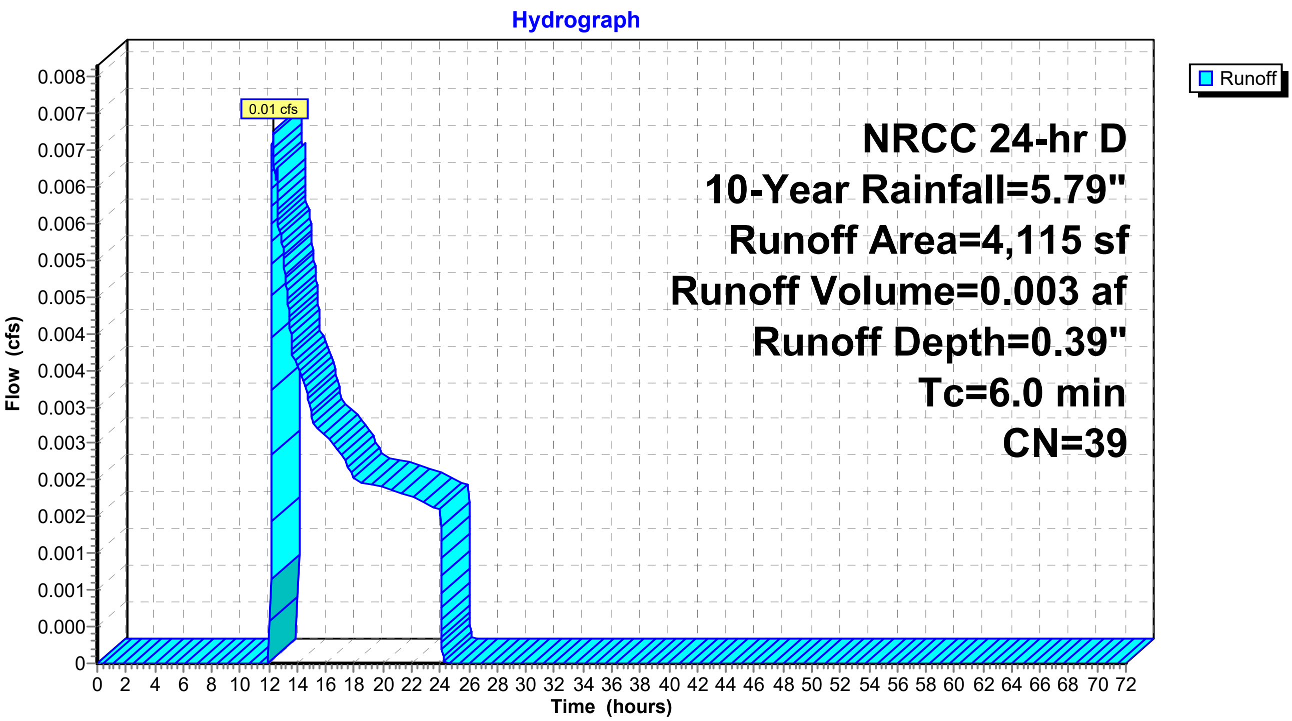
Runoff = 0.01 cfs @ 12.34 hrs, Volume= 0.003 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 10-Year Rainfall=5.79"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=575)

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 3.69" for 10-Year event
Inflow = 2.79 cfs @ 12.13 hrs, Volume= 0.211 af
Outflow = 1.19 cfs @ 12.10 hrs, Volume= 0.211 af, Atten= 57%, Lag= 0.0 min
Discarded = 1.19 cfs @ 12.10 hrs, Volume= 0.211 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.49' @ 12.25 hrs Surf.Area= 21,411 sf Storage= 748 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.8 min (833.9 - 832.2)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

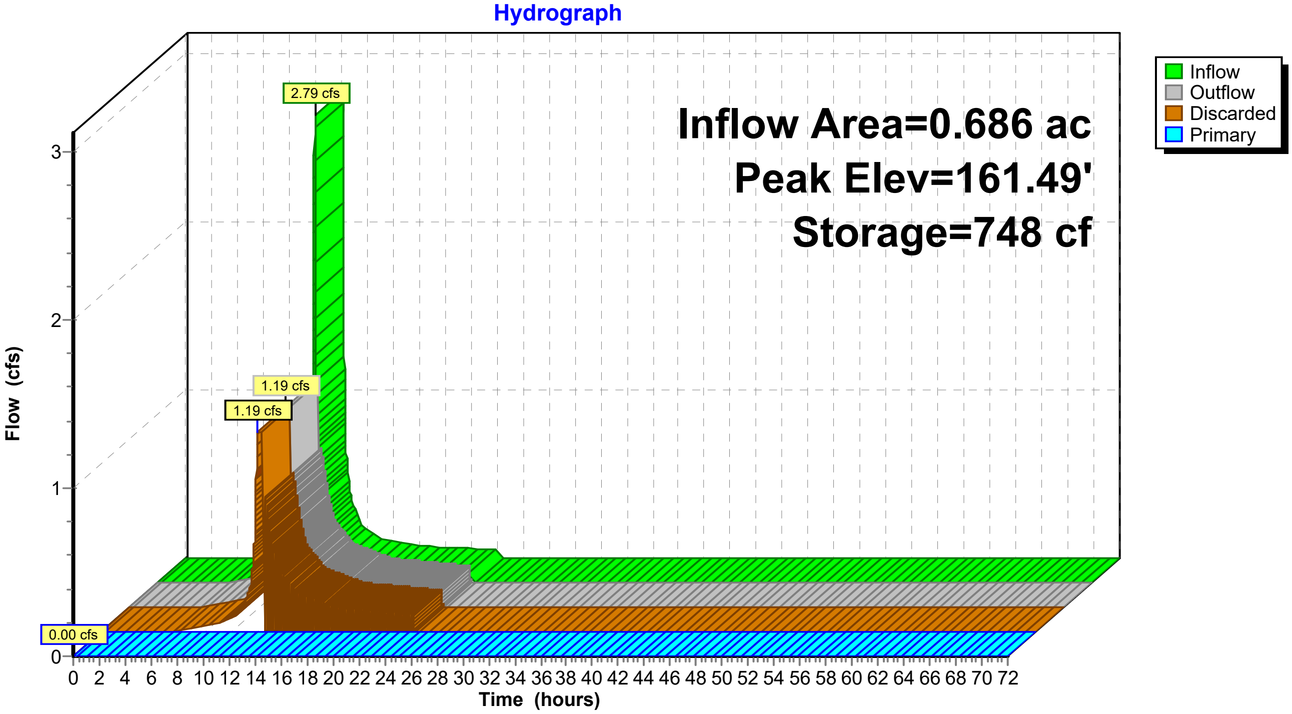
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.10 hrs HW=161.43' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

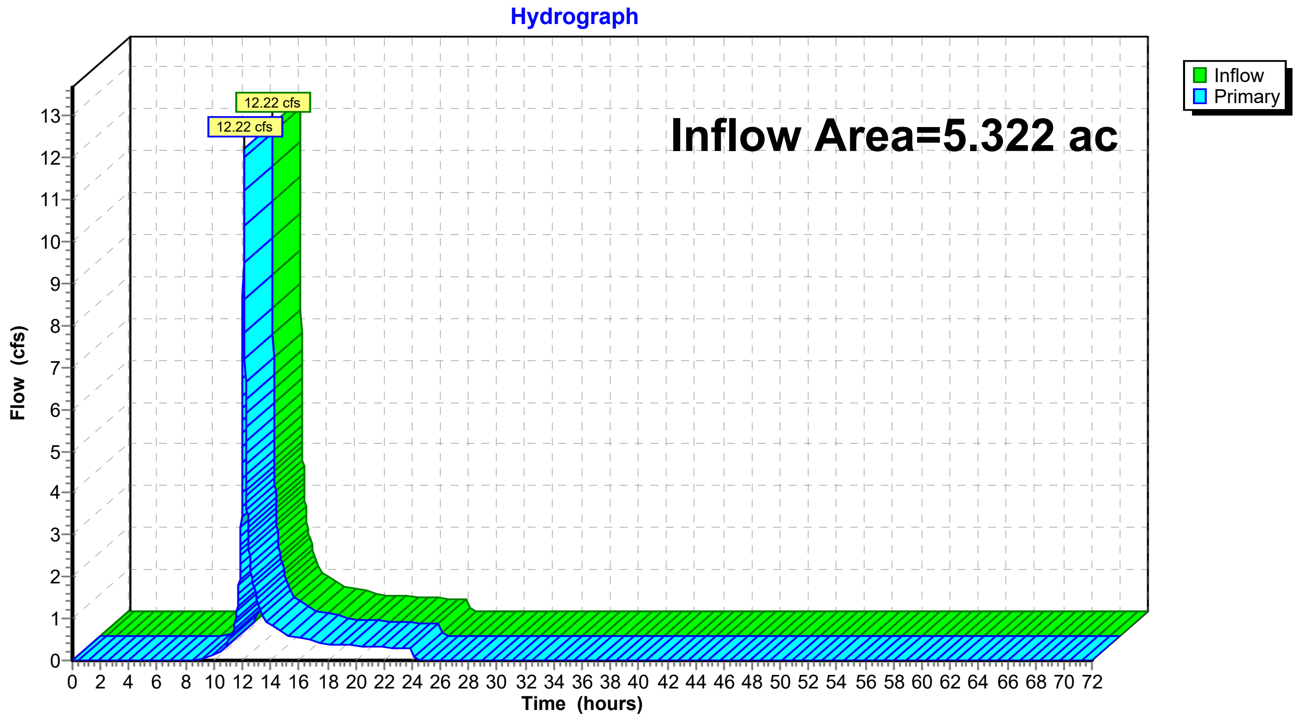


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.322 ac,	41.12% Impervious,	Inflow Depth = 2.07"	for 10-Year event
Inflow =	12.22 cfs @	12.13 hrs, Volume=	0.917 af	
Primary =	12.22 cfs @	12.13 hrs, Volume=	0.917 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

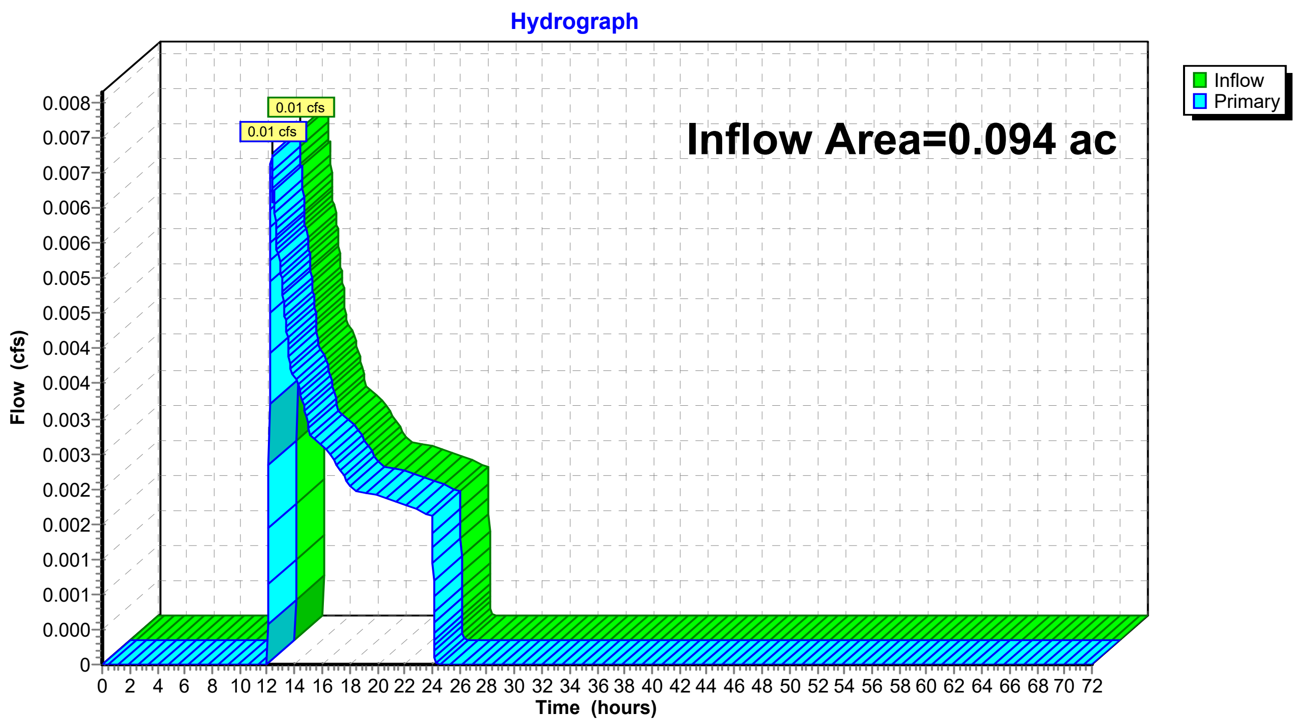


Summary for Link DP-2: Ditch

Inflow Area =	0.094 ac,	0.00% Impervious, Inflow Depth = 0.39"	for 10-Year event	
Inflow =	0.01 cfs @	12.34 hrs, Volume=	0.003 af	
Primary =	0.01 cfs @	12.34 hrs, Volume=	0.003 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Total Subcatchment1 Runoff Area=231,818 sf 41.12% Impervious Runoff Depth=3.91"
Tc=6.0 min CN=69 Runoff=23.23 cfs 1.735 af

Subcatchment1A: Subcatchment1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=3.69"
Tc=6.0 min CN=67 Runoff=19.13 cfs 1.427 af

Subcatchment1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=5.25"
Tc=6.0 min CN=81 Runoff=3.90 cfs 0.300 af

Subcatchment2: Subcatchment2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=0.95"
Tc=6.0 min CN=39 Runoff=0.06 cfs 0.007 af

Pond P1: Porous Pavement Peak Elev=161.59' Storage=1,616 cf Inflow=3.90 cfs 0.300 af
Discarded=1.19 cfs 0.300 af Primary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.300 af

Link DP-1: Reservoir and Swimming Area Inflow=19.13 cfs 1.427 af
Primary=19.13 cfs 1.427 af

Link DP-2: Ditch Inflow=0.06 cfs 0.007 af
Primary=0.06 cfs 0.007 af

Total Runoff Area = 10.738 ac Runoff Volume = 3.469 af Average Runoff Depth = 3.88"
59.24% Pervious = 6.362 ac 40.76% Impervious = 4.376 ac

Summary for Subcatchment 1: Total Subcatchment 1 Area

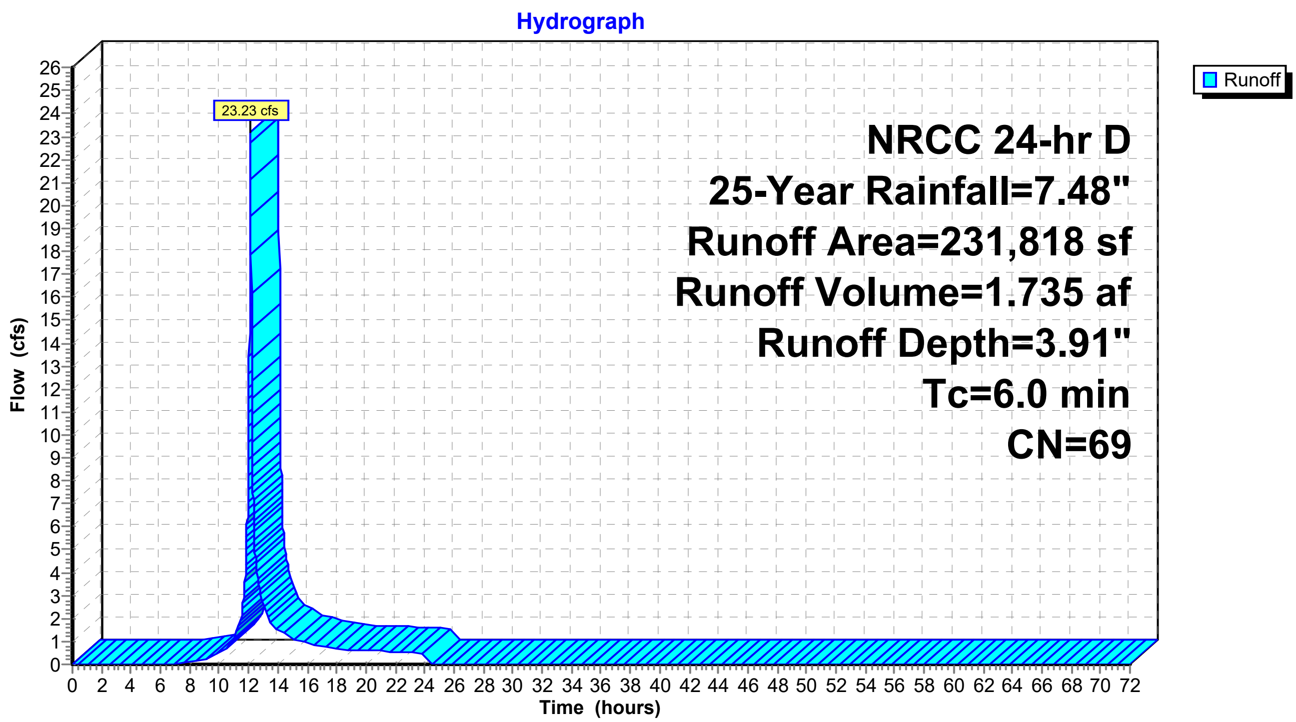
Runoff = 23.23 cfs @ 12.13 hrs, Volume= 1.735 af, Depth= 3.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=7.48"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	64,412	39	>75% Grass cover, Good, HSG A
	20,338	98	Impervious Surface, HSG A
*	22,688	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surfaces, Good, HSG A
	231,818	69	Weighted Average
	136,500		58.88% Pervious Area
	95,318		41.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Total Subcatchment 1 Area



Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

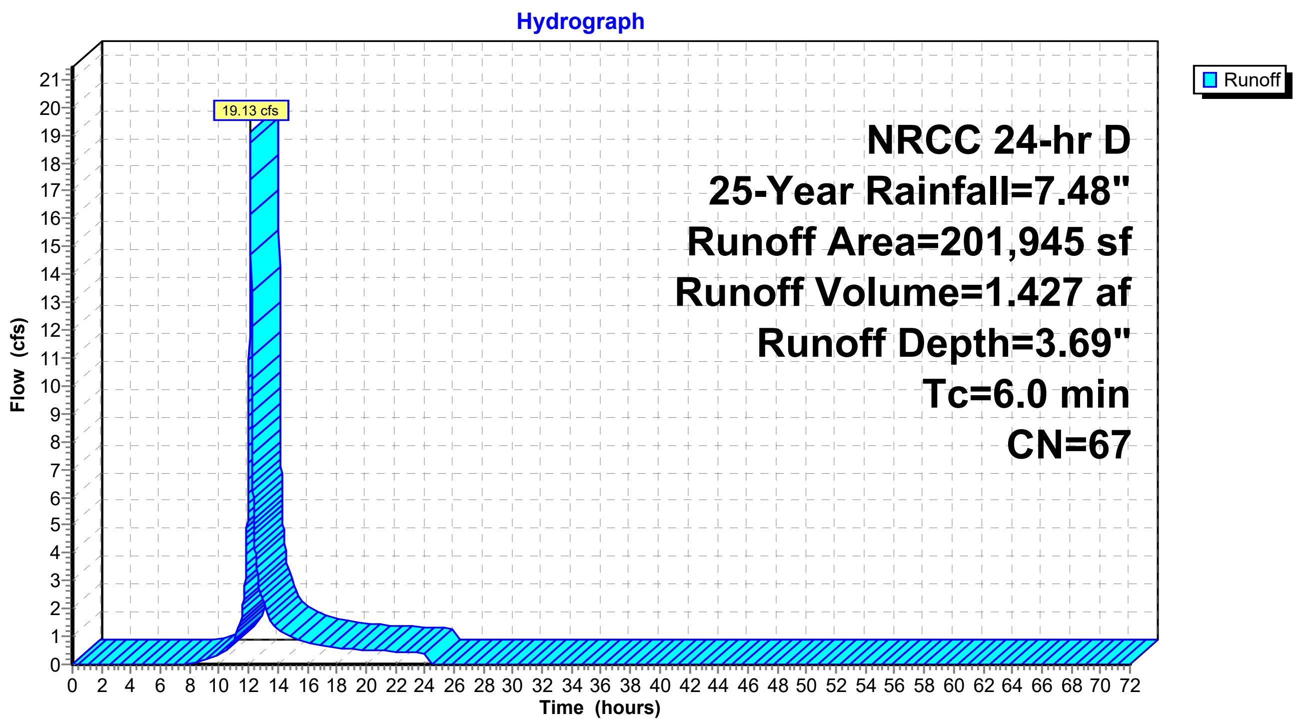
Runoff = 19.13 cfs @ 12.13 hrs, Volume= 1.427 af, Depth= 3.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=7.48"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

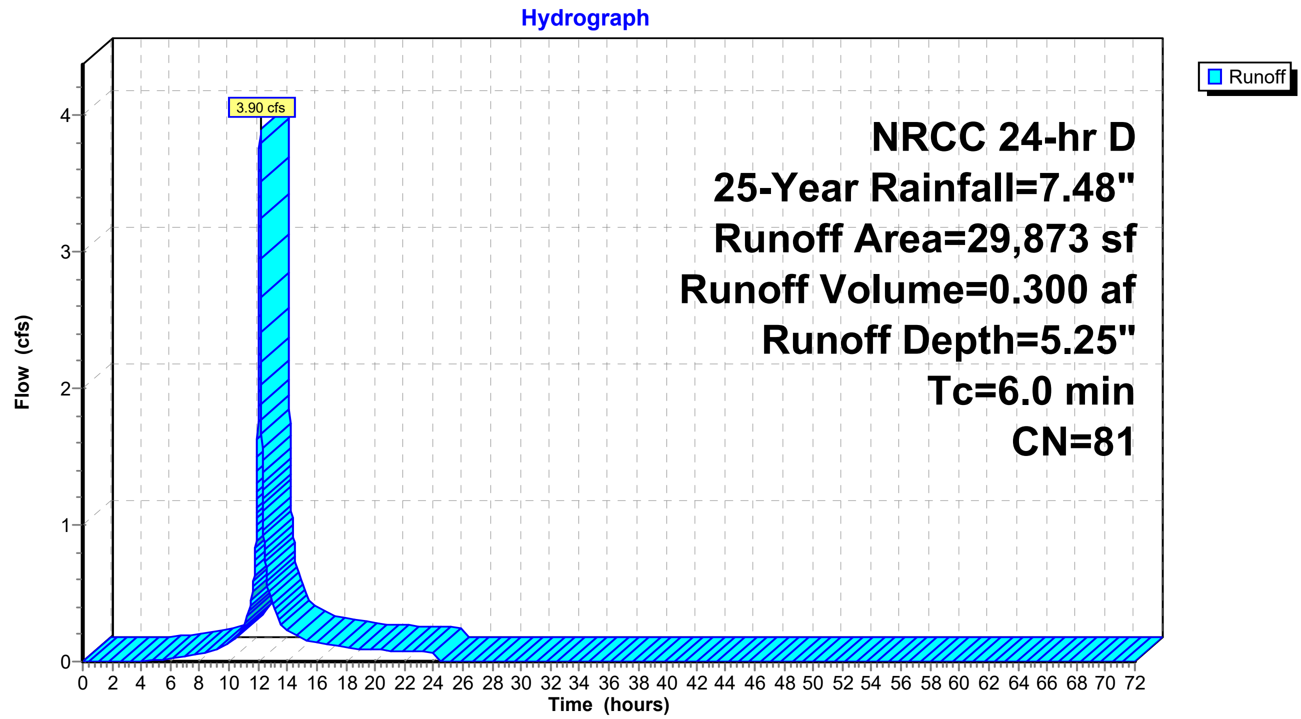
Runoff = 3.90 cfs @ 12.13 hrs, Volume= 0.300 af, Depth= 5.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=7.48"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

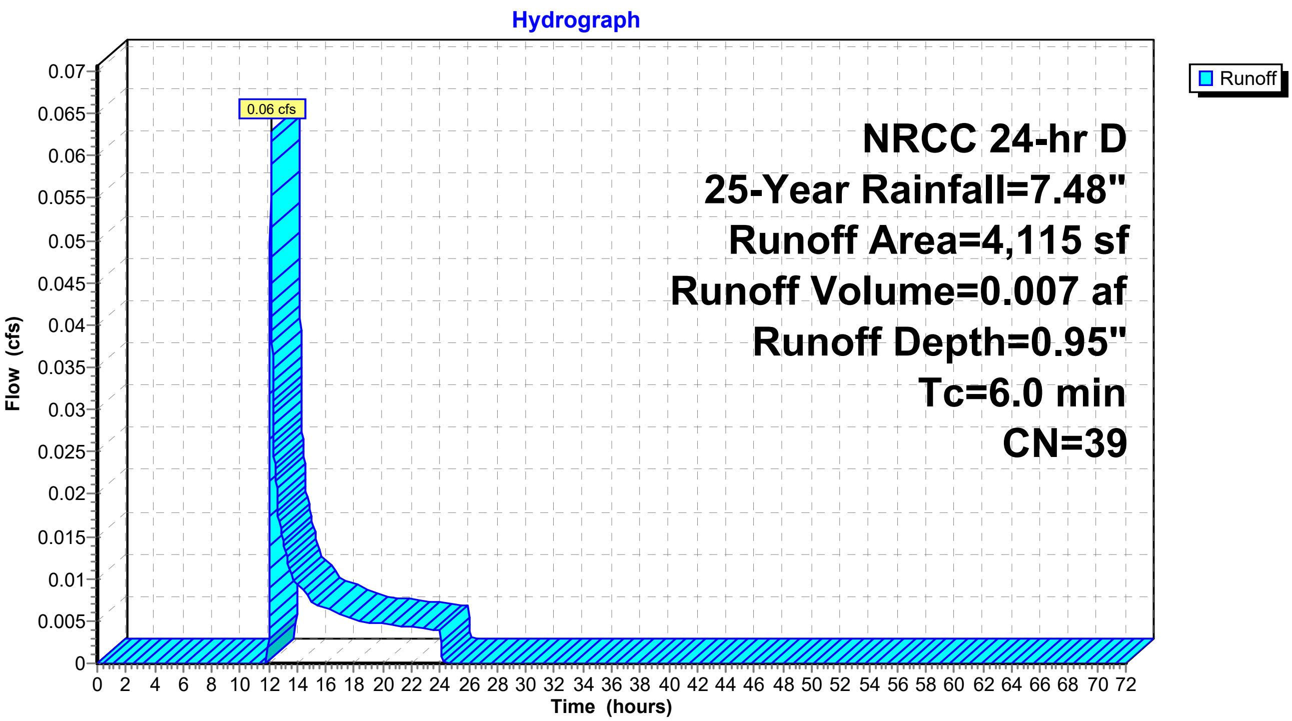
Runoff = 0.06 cfs @ 12.15 hrs, Volume= 0.007 af, Depth= 0.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 25-Year Rainfall=7.48"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=554)

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 5.25" for 25-Year event
Inflow = 3.90 cfs @ 12.13 hrs, Volume= 0.300 af
Outflow = 1.19 cfs @ 12.04 hrs, Volume= 0.300 af, Atten= 69%, Lag= 0.0 min
Discarded = 1.19 cfs @ 12.04 hrs, Volume= 0.300 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.59' @ 12.31 hrs Surf.Area= 21,411 sf Storage= 1,616 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 4.8 min (824.0 - 819.2)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

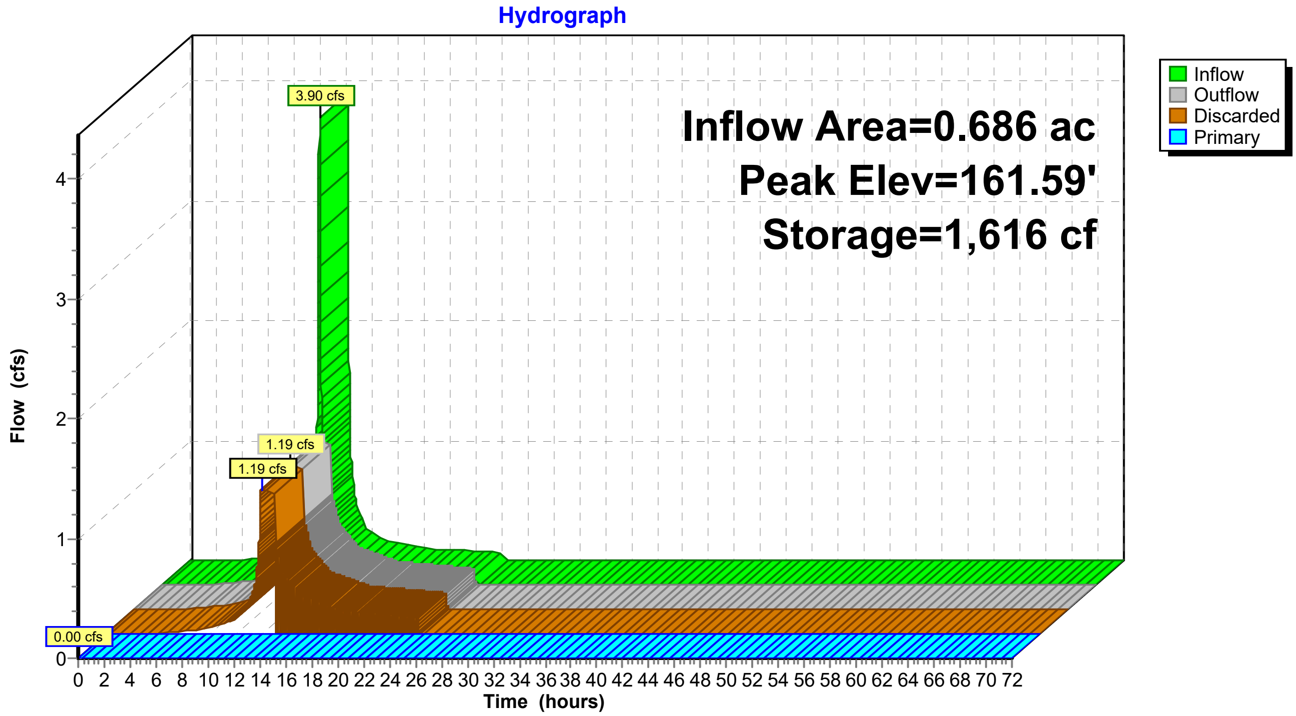
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 12.04 hrs HW=161.43' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

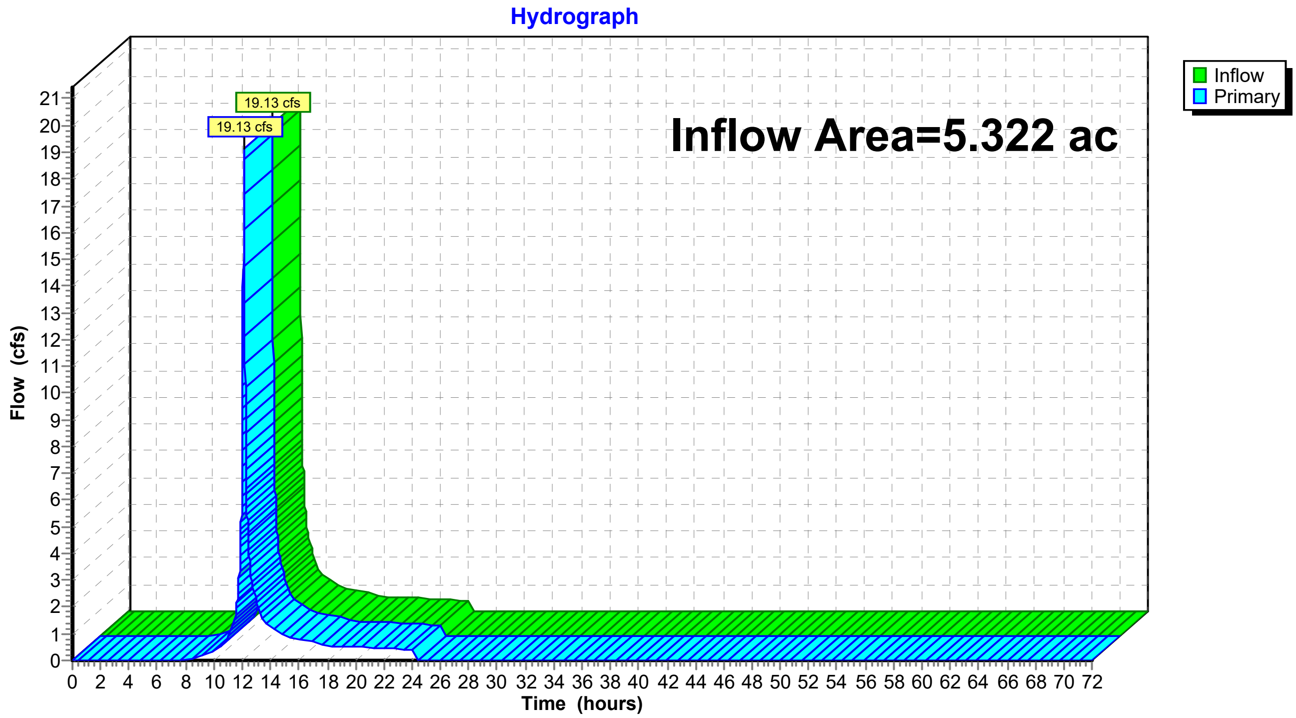


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area = 5.322 ac, 41.12% Impervious, Inflow Depth = 3.22" for 25-Year event
Inflow = 19.13 cfs @ 12.13 hrs, Volume= 1.427 af
Primary = 19.13 cfs @ 12.13 hrs, Volume= 1.427 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

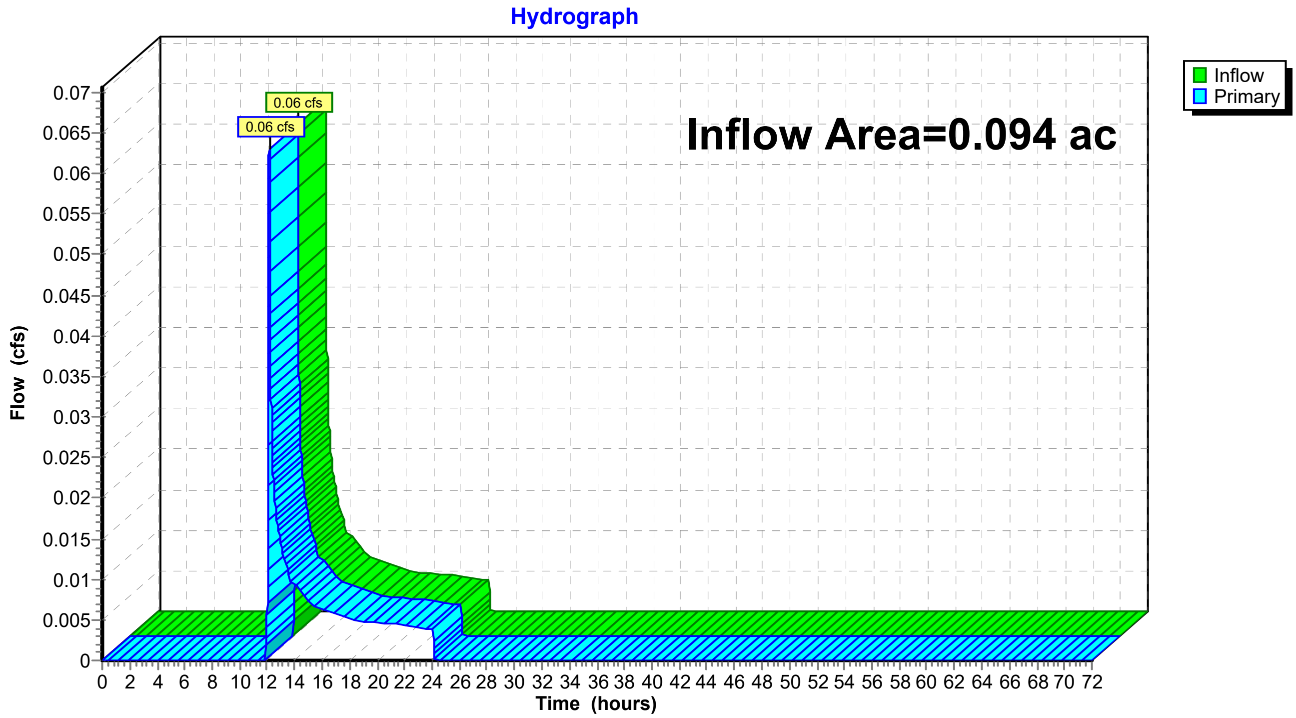


Summary for Link DP-2: Ditch

Inflow Area =	0.094 ac,	0.00% Impervious, Inflow Depth = 0.95"	for 25-Year event
Inflow =	0.06 cfs @	12.15 hrs, Volume=	0.007 af
Primary =	0.06 cfs @	12.15 hrs, Volume=	0.007 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



Time span=0.00-72.00 hrs, dt=0.01 hrs, 7201 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Total Subcatchment1 Runoff Area=231,818 sf 41.12% Impervious Runoff Depth=6.41"
Tc=6.0 min CN=69 Runoff=37.63 cfs 2.841 af

Subcatchment1A: Subcatchment1 Runoff Area=201,945 sf 36.57% Impervious Runoff Depth=6.14"
Tc=6.0 min CN=67 Runoff=31.54 cfs 2.371 af

Subcatchment1B: Area Draining to Runoff Area=29,873 sf 71.84% Impervious Runoff Depth=7.99"
Tc=6.0 min CN=81 Runoff=5.79 cfs 0.456 af

Subcatchment2: Subcatchment2 Runoff Area=4,115 sf 0.00% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=39 Runoff=0.21 cfs 0.018 af

Pond P1: Porous Pavement Peak Elev=161.80' Storage=3,457 cf Inflow=5.79 cfs 0.456 af
Discarded=1.19 cfs 0.456 af Primary=0.00 cfs 0.000 af Outflow=1.19 cfs 0.456 af

Link DP-1: Reservoir and Swimming Area Inflow=31.54 cfs 2.371 af
Primary=31.54 cfs 2.371 af

Link DP-2: Ditch Inflow=0.21 cfs 0.018 af
Primary=0.21 cfs 0.018 af

Total Runoff Area = 10.738 ac Runoff Volume = 5.686 af Average Runoff Depth = 6.35"
59.24% Pervious = 6.362 ac 40.76% Impervious = 4.376 ac

Summary for Subcatchment 1: Total Subcatchment 1 Area

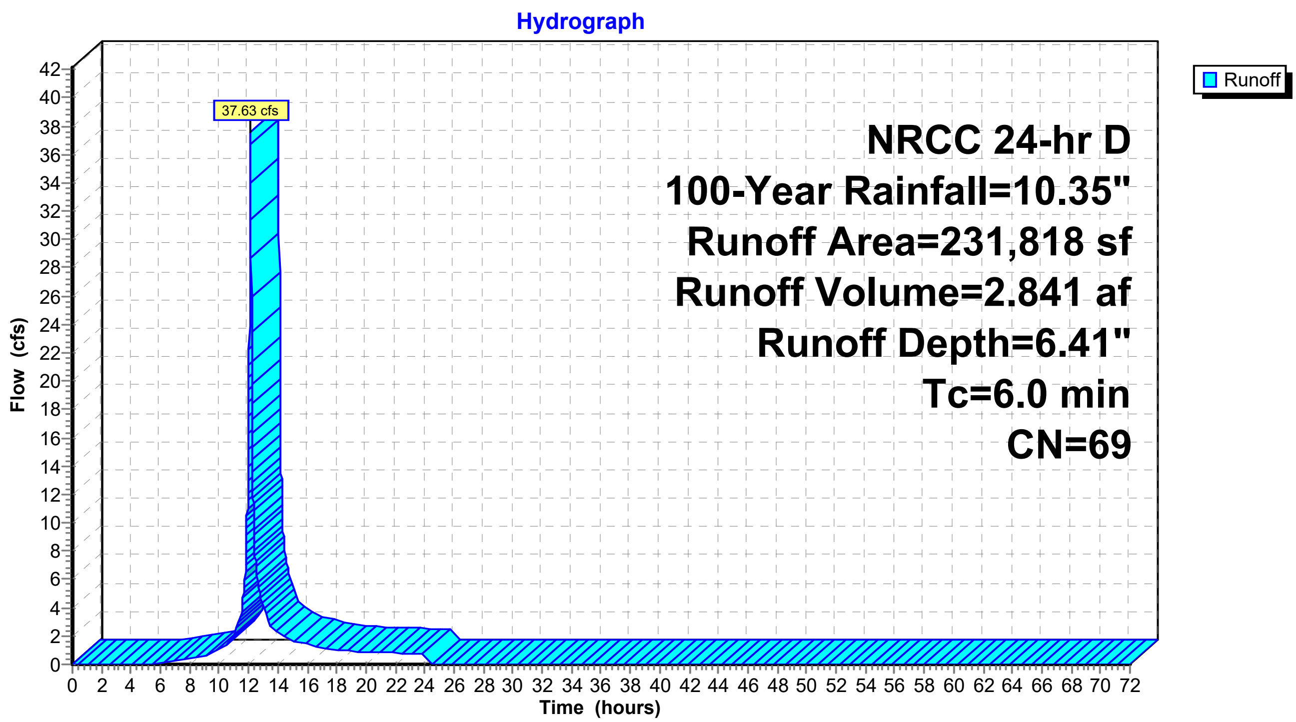
Runoff = 37.63 cfs @ 12.13 hrs, Volume= 2.841 af, Depth= 6.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=10.35"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	64,412	39	>75% Grass cover, Good, HSG A
	20,338	98	Impervious Surface, HSG A
*	22,688	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surfaces, Good, HSG A
	231,818	69	Weighted Average
	136,500		58.88% Pervious Area
	95,318		41.12% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1: Total Subcatchment 1 Area



Summary for Subcatchment 1A: Subcatchment 1 Minus Parking Lot

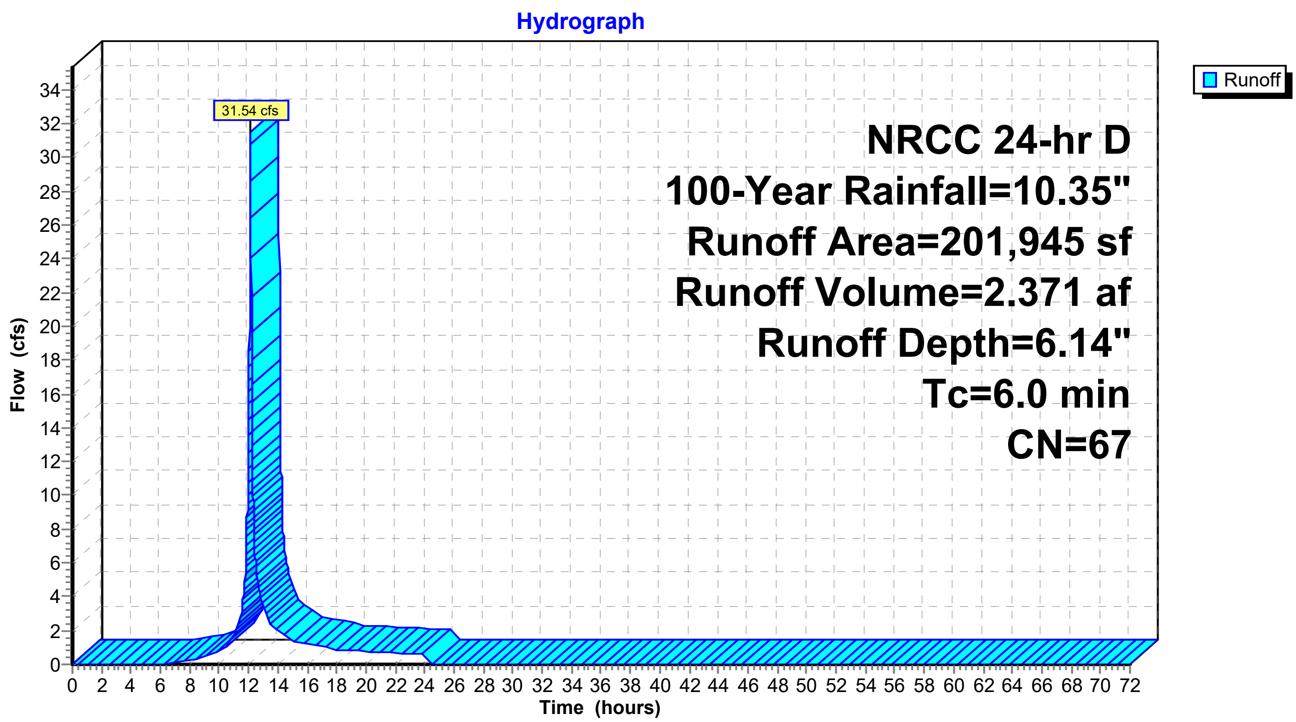
Runoff = 31.54 cfs @ 12.13 hrs, Volume= 2.371 af, Depth= 6.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=10.35"

	Area (sf)	CN	Description
	13,237	30	Brush, Good, HSG A
*	44,830	63	Beach Sand, HSG A
	56,001	39	>75% Grass cover, Good, HSG A
	19,764	98	Impervious Surface, HSG A
*	1,800	98	Porous Pavement, HSG A
	52,292	98	Water Surface, HSG A
*	6,010	96	Stone Dust, HSG A
*	8,011	39	Permeable Playground Surface, Good, HSG A
	201,945	67	Weighted Average
	128,089		63.43% Pervious Area
	73,856		36.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1A: Subcatchment 1 Minus Parking Lot



Summary for Subcatchment 1B: Area Draining to Parking Lot

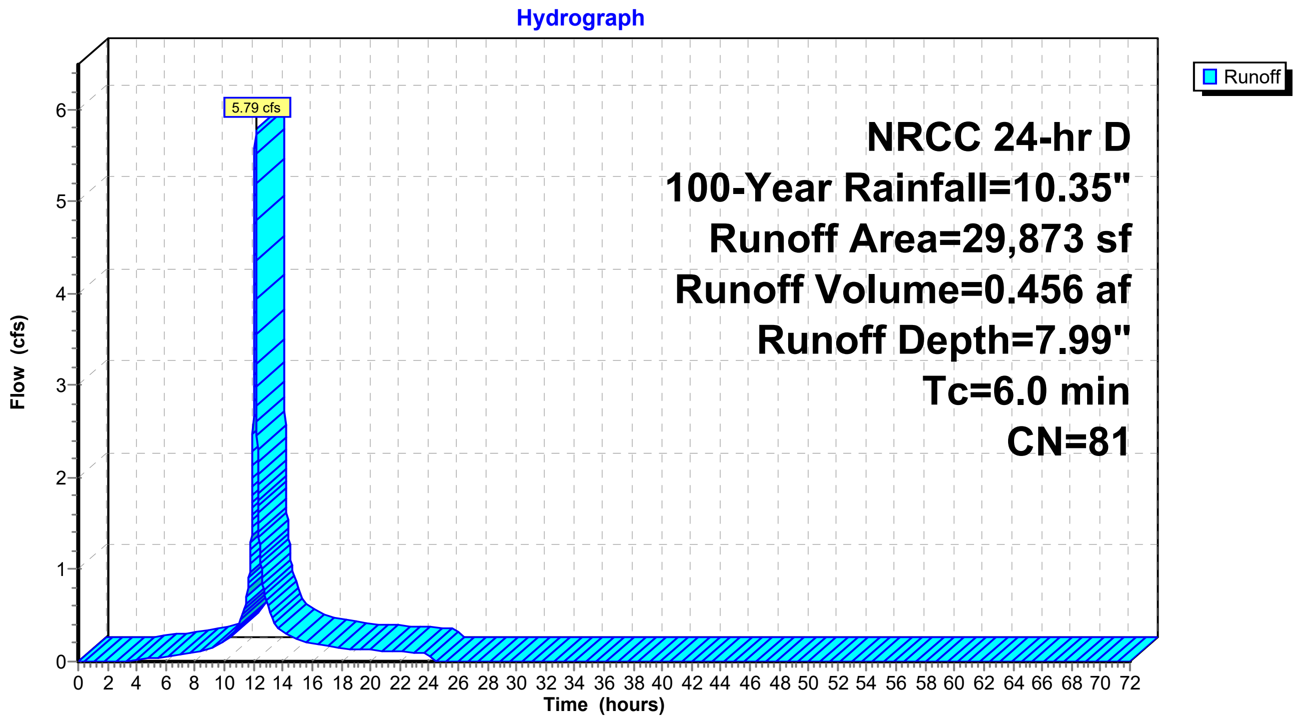
Runoff = 5.79 cfs @ 12.13 hrs, Volume= 0.456 af, Depth= 7.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=10.35"

	Area (sf)	CN	Description
	8,411	39	>75% Grass cover, Good, HSG A
	574	98	Impervious Surface, HSG A
*	20,888	98	Porous Pavement, HSG A
	29,873	81	Weighted Average
	8,411		28.16% Pervious Area
	21,462		71.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 1B: Area Draining to Parking Lot



Summary for Subcatchment 2: Subcatchment 2

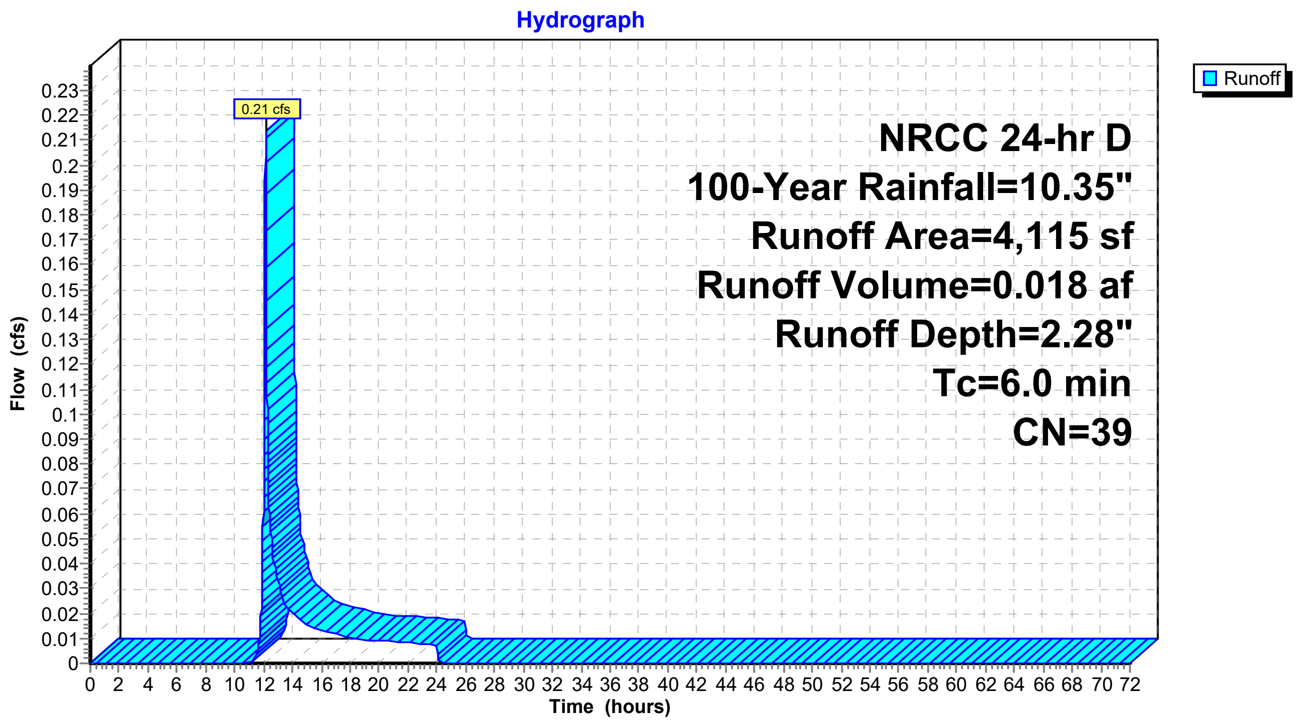
Runoff = 0.21 cfs @ 12.14 hrs, Volume= 0.018 af, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
NRCC 24-hr D 100-Year Rainfall=10.35"

Area (sf)	CN	Description
4,115	39	>75% Grass cover, Good, HSG A
4,115		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 2: Subcatchment 2



Summary for Pond P1: Porous Pavement

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=510)

Inflow Area = 0.686 ac, 71.84% Impervious, Inflow Depth = 7.99" for 100-Year event
Inflow = 5.79 cfs @ 12.13 hrs, Volume= 0.456 af
Outflow = 1.19 cfs @ 11.96 hrs, Volume= 0.456 af, Atten= 79%, Lag= 0.0 min
Discarded = 1.19 cfs @ 11.96 hrs, Volume= 0.456 af
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs
Peak Elev= 161.80' @ 12.41 hrs Surf.Area= 21,411 sf Storage= 3,457 cf
Flood Elev= 164.00' Surf.Area= 42,822 sf Storage= 11,383 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 12.9 min (817.1 - 804.2)

Volume	Invert	Avail.Storage	Storage Description
#1	161.40'	7,099 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 17,771 cf Overall - 23 cf Embedded = 17,749 cf x 40.0% Voids
#2	162.23'	4,261 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)
#3	161.73'	23 cf	**4.0" Round Pipe Storage** Inside #1 L= 258.0'
		11,383 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
161.40	21,411	0	0
162.23	21,411	17,771	17,771

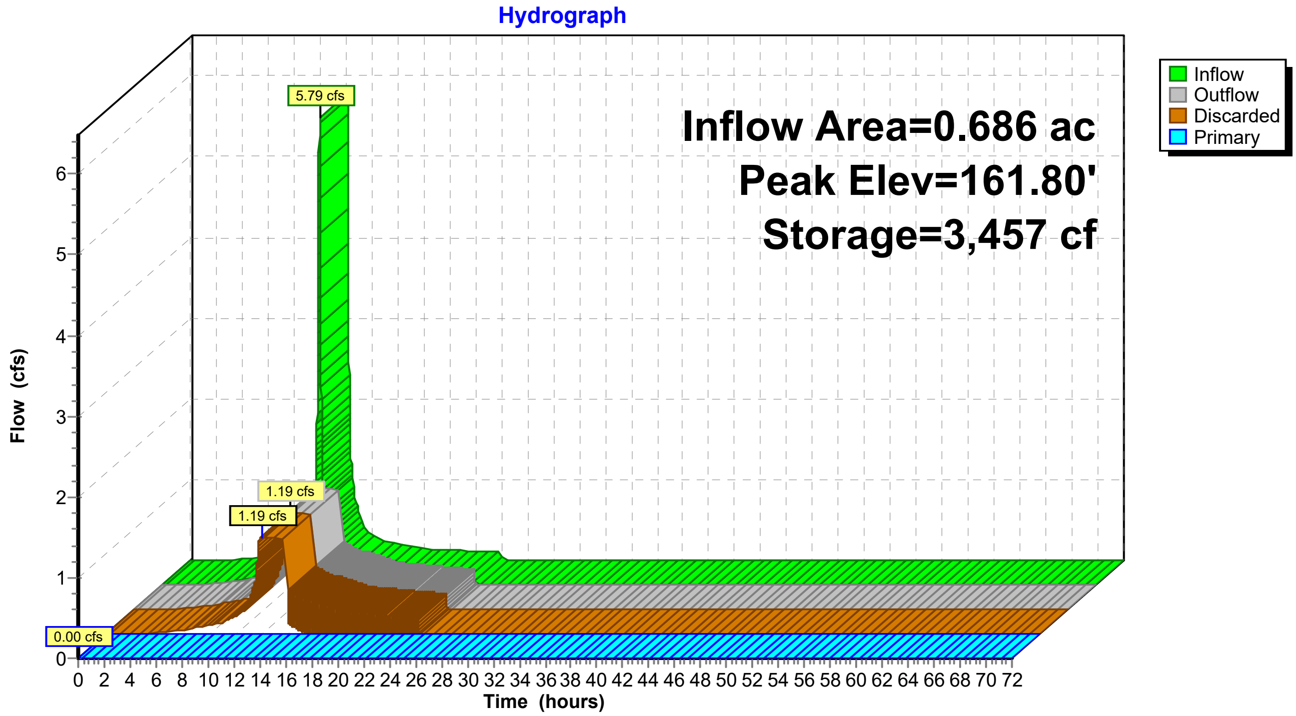
Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
162.23	21,411	0.0	0	0
162.48	21,411	40.0	2,141	2,141
162.81	21,411	30.0	2,120	4,261

Device	Routing	Invert	Outlet Devices
#1	Primary	162.15'	**12.0" Round Culvert** L= 20.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 162.15' / 162.05' S= 0.0050 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	161.73'	**4.0" Vert. Orifice/Grate** C= 0.600
#3	Discarded	161.40'	**2.410 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=1.19 cfs @ 11.96 hrs HW=161.43' (Free Discharge)
└─**3=Exfiltration** (Exfiltration Controls 1.19 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=161.40' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
  └─**2=Orifice/Grate** (Controls 0.00 cfs)

Pond P1: Porous Pavement

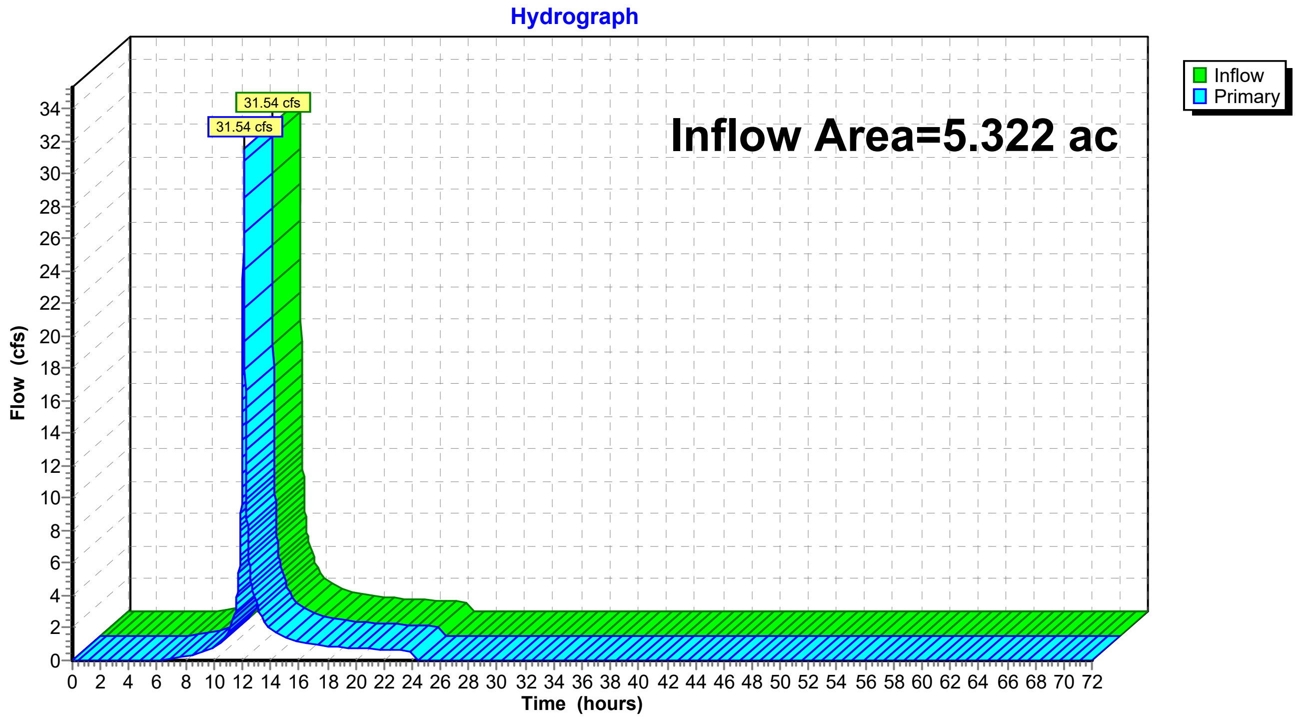


Summary for Link DP-1: Reservoir and Swimming Area

Inflow Area =	5.322 ac, 41.12% Impervious, Inflow Depth = 5.35"	for 100-Year event	
Inflow =	31.54 cfs @ 12.13 hrs, Volume=	2.371 af	
Primary =	31.54 cfs @ 12.13 hrs, Volume=	2.371 af, Atten= 0%, Lag= 0.0 min	

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-1: Reservoir and Swimming Area

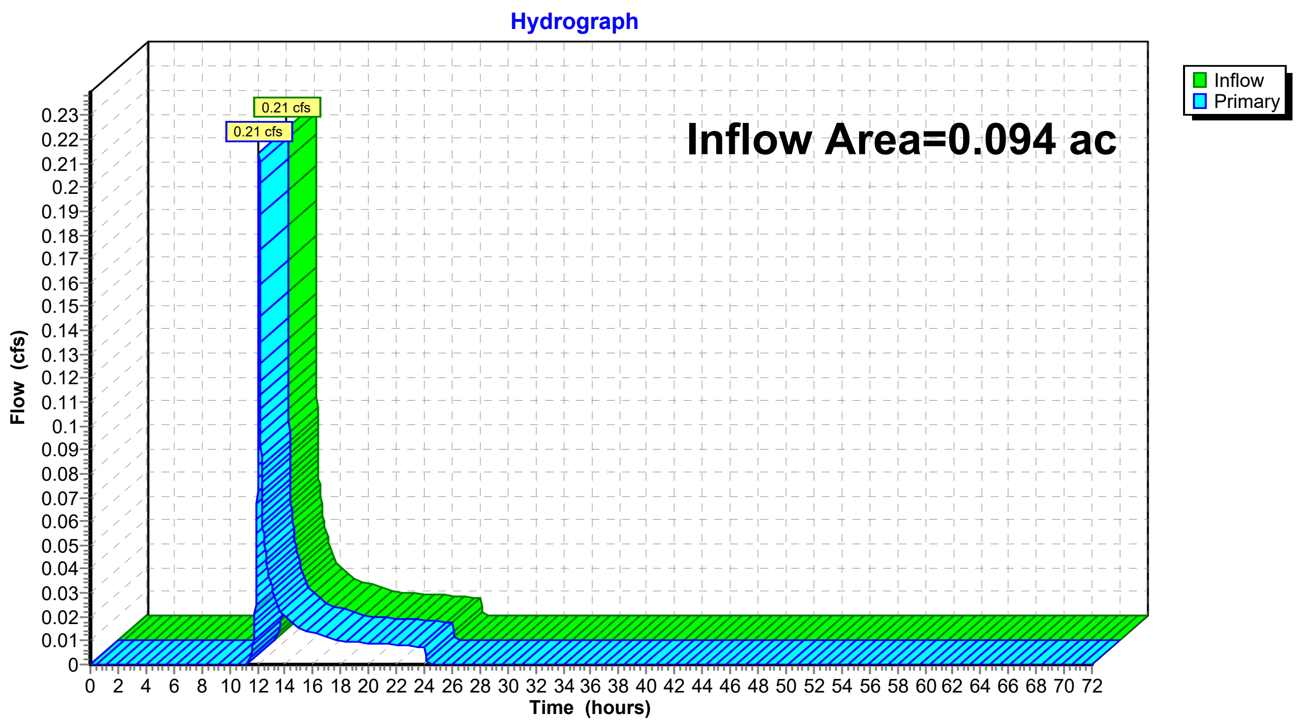


Summary for Link DP-2: Ditch

Inflow Area =	0.094 ac,	0.00% Impervious, Inflow Depth = 2.28"	for 100-Year event	
Inflow =	0.21 cfs @	12.14 hrs, Volume=	0.018 af	
Primary =	0.21 cfs @	12.14 hrs, Volume=	0.018 af,	Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-72.00 hrs, dt= 0.01 hrs

Link DP-2: Ditch



APPENDIX E: OPERATIONS & MAINTENANCE PLAN

STORMWATER MANAGEMENT SYSTEM
OPERATION & MAINTENANCE PLAN

This Stormwater Management System Operations & Maintenance Plan (the Plan) outlines measures that are essential for maintaining an effective stormwater management system at the Arlington Reservoir, located at 210 Lowell Street in Arlington, Massachusetts (the Site). Periodic and scheduled inspections and maintenance measures are recommended to prevent deficiencies and for proper performance of the stormwater management system. Failure to implement these measures can reduce the hydraulic capacity and the pollutant removal efficiency of stormwater measures resulting in a poor quality of stormwater runoff discharging from the Site.

RESPONSIBLE PARTY & ESTIMATED ANNUAL BUDGET

The party responsible for implementing this Plan and identifying the source of necessary funds is as follows:

Town of Arlington, Massachusetts – Department of Public Works
51 Grove Street
Arlington, MA 02476
Telephone: (781) 316-3301

GOOD HOUSEKEEPING

The Site will be maintained as clean and orderly. Routine inspections of the Site for debris and sediment accumulations shall be performed. Debris and sediment shall be disposed of in accordance with local and State requirements.

INSPECTIONS & MAINTENANCE MEASURES

Stormwater management is provided by porous pavement sections, as illustrated on the Site Plans. Routine inspections and maintenance of the stormwater management system shall be performed in accordance with this Operation & Maintenance Plan. These measures are recommended to prevent deficiencies within the system that may result in poor quality of stormwater runoff.

A sample Inspection Form is attached and is recommended for use during inspections of the stormwater management system. The form includes a table that outlines specific inspection and maintenance measures, in addition to the following information that can be recorded by the inspector during the inspection. Completed Inspections Forms shall be kept at the Site to enable both Department of Public Works staff members and regulatory agencies to ensure that operation of the system is in compliance with this Operation & Maintenance Plan.

SOLID WASTE CONTAINMENT

Trash and recycling receptacles will be provided throughout the Site, as necessary. Receptacles should remain covered to prevent exposure with stormwater and to ensure waste will remain inside the receptacle. Waste collection must be performed regularly.

LANDSCAPE MANAGEMENT

Lawn and landscaped areas shall be inspected for patches of dead vegetation and erosion. If these conditions are observed, affected areas shall be stabilized and replanted with vegetation to prevent sediment from entering the stormwater management system.

The following measures shall be followed to minimize the potential for stormwater runoff pollution due to overwatering, dead vegetation and erosion, direct disposal of lawn clippings, and over-application of materials such as fertilizers and pesticides.

<u>Lawn Mowing</u>

The following mowing practices are recommended:

- Maintain sharp mower blades.

- Typically, avoid cutting grass shorter than 2 to 3 inches in height, to minimize weed growth. Grass can be cut lower in the spring and fall to stimulate root growth but should not be cut shorter than $1^1/_2$ inches.
- Do not dispose of grass clippings within the stormwater management system.
- Employ practices to minimize the potential for grass clippings to enter the stormwater management system.

Fertilizers & Pesticides

Use of pesticides and fertilizers should be minimized to the extent practicable. Application of these materials may degrade the quality of stormwater runoff and should therefore be applied cautiously. In addition, fertilizers and pesticides shall not be applied prior to rain events. These materials should be stored under cover to prevent their exposure to stormwater.

PERVIOUS AREA MANAGEMENT

Winter Operations

Remove accumulated snow after winter storm events to keep the site's parking lots open for operations and maintenance activities. Snow shall not be stored within pervious areas.

Plows with poly cutting blades are required for snow removal. With their use, no alterations to typical snow removal activities are required. Sand will prematurely clog the porous pavement system and should not be used for deicing. Magnesium Chloride is an alternative material that can be used for deicing, if necessary. Snow melts faster on porous pavement than traditional pavement, as melting water does not remain on the surface to insulate the remaining ice.

Pervious Pavement

The pervious pavement system shall be monitored for permeability and maintained with a regenerative air sweeper at least twice a year or more frequently, as needed. The frequency of cleanings will vary depending on Site conditions including frequency of traffic, local climate, and surrounding environment but should be performed once in the Spring and once in the Fall (after leaves have fallen but before the first snow fall) to assure the pavement's long function life.

Damage to the surface of the porous pavement can be repaired by using a concrete saw to remove the damaged area and installing new porous pavement in its place.

STORMWATER MANAGEMENT SYSTEM INSPECTION FORM

Town of Arlington, Massachusetts
Arlington Reservoir
210 Lowell Street
Arlington, MA 02474

Name of Inspector: ______________________________
Date/Time: ______________________________
Weather: ______________________________
Date of Last Inspection: ______________________________

Items Inspected (refer to Table 1 and provide additional sheets if necessary):

____
____
____
____
____
____
____
____
____

Comments & Corrective Actions Taken (provide additional sheets if necessary):

____
____
____
____
____
____
____
____

Table 1 – Operations & Maintenance Measures

Porous Pavement	
Objective: *Maintain the infiltration and storage capacity of the porous pavement section.*	
Frequency	***Measure***
Ongoing/As Needed	• Monitor the surface of the porous pavement to proper drainage is achieved during storm events.
Quarterly	• Remove sediment and organic debris on the porous pavement surface using a vacuum sweeper.
Bi-Annually (once in Spring and once in Fall)	• Inspect the surface of the porous pavement for deterioration or clogging. • Assess the infiltration capacity of the porous pavement sections.
Additional Comments	• Do not stockpile snow on porous pavement surface. This will require additional maintenance and vacuuming. • Do not sand over porous pavement surface.

APPENDIX F: STORMWATER POLLUTION PREVENTION PLAN

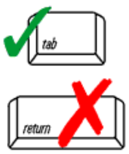
APPENDIX G: MASSDEP CHECKLIST FOR STORMWATER REPORT

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☐ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☒ Reduced Impervious Area (Redevelopment Only)
- ☒ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☒ Use of “country drainage” versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): ____________________

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☐ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☐ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☐ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☒ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☒ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☐ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

  ☐ is within the Zone II or Interim Wellhead Protection Area

  ☐ is near or to other critical areas

  ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)

  ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☐ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☐ The BMP is sized (and calculations provided) based on:

- ☐ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☒ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☒ Critical areas and BMPs are identified in the Stormwater Report.

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☒ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☒ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☒ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☐ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☐ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☐ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☐ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☒ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

WOODARD &CURRAN

woodardcurran.com

COMMITMENT & INTEGRITY DRIVE RESULTS

Town of Arlington, Massachusetts

Request for Determination of Applicability

Summary:

Request for Determination of Applicability: 59 Lowell Street
Arlington File #A21.1

8:30pm	The project proposes to construct an above-ground exercise swim spa partially within the Wetlands 100-ft Buffer and Adjacent Upload Resource Area (AURA) of No Name Brook.

ATTACHMENTS:

	Type	File Name	Description
🗋	Request for Determination of Applicability	59_Lowell_Street_RDA_WPA_Form_1.pdf	59 Lowell St RDA WPA Form 1
🗋	Request for Determination of Applicability	59_Lowell_Street_RDA.pdf	59 Lowell St RDA
🗋	Request for Determination of Applicability	59_Lowell_Street_RDA_Photos.pdf	59 Lowell St RDA Site Photos

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 1- Request for Determination of Applicability

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

Arlington
City/Town

A. General Information

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

1. Applicant:

Kathleen Moriarty
Name

kathleen.moriarty.ietf@gmail.com
E-Mail Address

59 Lowell Street
Mailing Address

Arlington
City/Town

MA
State

02476
Zip Code

617-583-0846
Phone Number

Fax Number (if applicable)

2. Representative (if any):

Firm

Contact Name

E-Mail Address

Mailing Address

City/Town

State

Zip Code

Phone Number

Fax Number (if applicable)

B. Determinations

1. I request the ______________ make the following determination(s). Check any that apply:
Conservation Commission

☑ a. whether the **area** depicted on plan(s) and/or map(s) referenced below is an area subject to jurisdiction of the Wetlands Protection Act.

☑ b. whether the **boundaries** of resource area(s) depicted on plan(s) and/or map(s) referenced below are accurately delineated.

☑ c. whether the **work** depicted on plan(s) referenced below is subject to the Wetlands Protection Act.

☑ d. whether the area and/or work depicted on plan(s) referenced below is subject to the jurisdiction of any **municipal wetlands ordinance** or **bylaw** of:

Town of Arlington
Name of Municipality

☑ e. whether the following **scope of alternatives** is adequate for work in the Riverfront Area as depicted on referenced plan(s).

I am proposing to plant native vegetation to mitigate flooding and contribute to water infiltration.

Plant a bush towards end of yard to absorb additional water from the ground to ot

C. Project Description

1. a. Project Location (use maps and plans to identify the location of the area subject to this request):

59 Lowell Street	Arlington
Street Address	City/Town
Assessors Map/Plat Number	Parcel/Lot Number

b. Area Description (use additional paper, if necessary):

plans attached

c. Plan and/or Map Reference(s):

Title	Date
Survey with included propopsed spa (hot tub)	4 December 2020
Conservation Land plot with protected land identified	4 December 2020
Slope of yard	4 December 2020

2. a. Work Description (use additional paper and/or provide plan(s) of work, if necessary):

Add a portable swim spa to yard for exercise purposes. Add a bush to offset imprevious land addition.

C. Project Description (cont.)

b. Identify provisions of the Wetlands Protection Act or regulations which may exempt the applicant from having to file a Notice of Intent for all or part of the described work (use additional paper, if necessary).

3. a. If this application is a Request for Determination of Scope of Alternatives for work in the Riverfront Area, indicate the one classification below that best describes the project.

- [x] Single family house on a lot recorded on or before 8/1/96
- [ ] Single family house on a lot recorded after 8/1/96
- [ ] Expansion of an existing structure on a lot recorded after 8/1/96
- [ ] Project, other than a single-family house or public project, where the applicant owned the lot before 8/7/96
- [ ] New agriculture or aquaculture project
- [ ] Public project where funds were appropriated prior to 8/7/96
- [ ] Project on a lot shown on an approved, definitive subdivision plan where there is a recorded deed restriction limiting total alteration of the Riverfront Area for the entire subdivision
- [ ] Residential subdivision; institutional, industrial, or commercial project
- [ ] Municipal project
- [ ] District, county, state, or federal government project
- [ ] Project required to evaluate off-site alternatives in more than one municipality in an Environmental Impact Report under MEPA or in an alternatives analysis pursuant to an application for a 404 permit from the U.S. Army Corps of Engineers or 401 Water Quality Certification from the Department of Environmental Protection.

b. Provide evidence (e.g., record of date subdivision lot was recorded) supporting the classification above (use additional paper and/or attach appropriate documents, if necessary.)

Documentation from 1997 (house survey from previous owners included. House bui

D. Signatures and Submittal Requirements

I hereby certify under the penalties of perjury that the foregoing Request for Determination of Applicability and accompanying plans, documents, and supporting data are true and complete to the best of my knowledge.

I further certify that the property owner, if different from the applicant, and the appropriate DEP Regional Office were sent a complete copy of this Request (including all appropriate documentation) simultaneously with the submittal of this Request to the Conservation Commission.

Failure by the applicant to send copies in a timely manner may result in dismissal of the Request for Determination of Applicability.

Name and address of the property owner:

Kathleen M Moriarty
Name

59 Lowell Street
Mailing Address

Arlington
City/Town

MA
State

02476
Zip Code

Signatures:

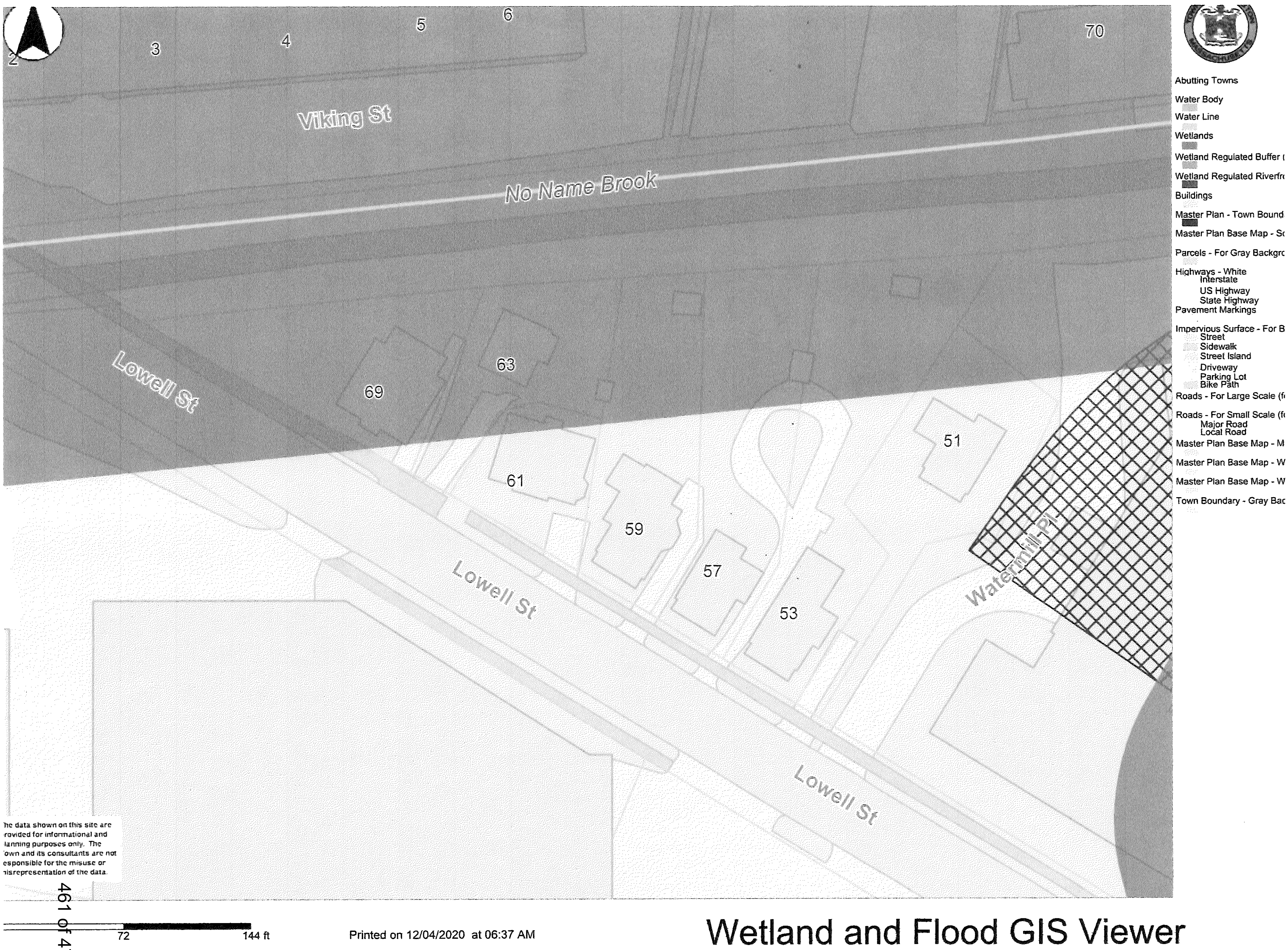
I also understand that notification of this Request will be placed in a local newspaper at my expense in accordance with Section 10.05(3)(b)(1) of the Wetlands Protection Act regulations.

Signature of Applicant

4 December 2020
Date

Signature of Representative (if any)

Date



he data shown on this site are
rovided for informational and
lanning purposes only. The
own and its consultants are not
esponsible for the misuse or
nisrepresentation of the data.

Printed on 12/04/2020 at 06:37 AM

Wetland and Flood GIS Viewer

Adam's Quality Masonry
53 Fairmount Ave
Wakefield, MA 01880 US
+1 5086417989
adam@adamsqualitymasonry.com

AQM CONTRACTING

Estimate

ADDRESS
Kathleen Moriarty

ESTIMATE # 1111-172
DATE 12/15/2020

SERVICE	DESCRIPTION	QTY	RATE	AMOUNT
Masonry	Excavate dirt and haul it away. Build frame and pour concrete level about 8' x 15' with 1/2 rebar	1	4,500.00	4,500.00
Landscaping	Brin loan in and grade yard	1	500.00	500.00

Payment Schedule
1/2 deposit 1/2 upon completion

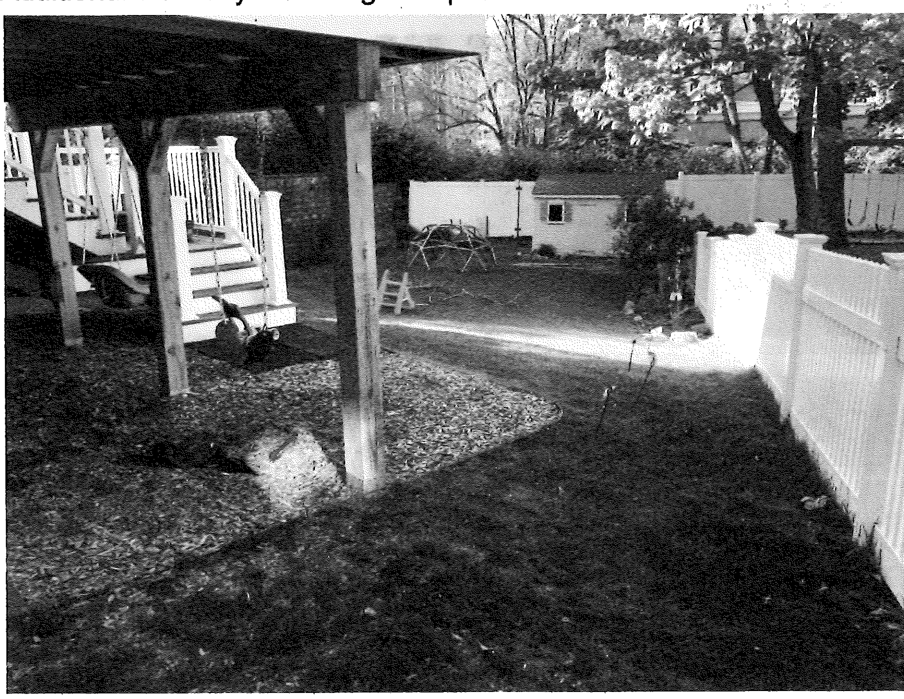
TOTAL **$5,000.00**

Fully licensed with CSL and HIC
Fully insured

Accepted By

Accepted Date

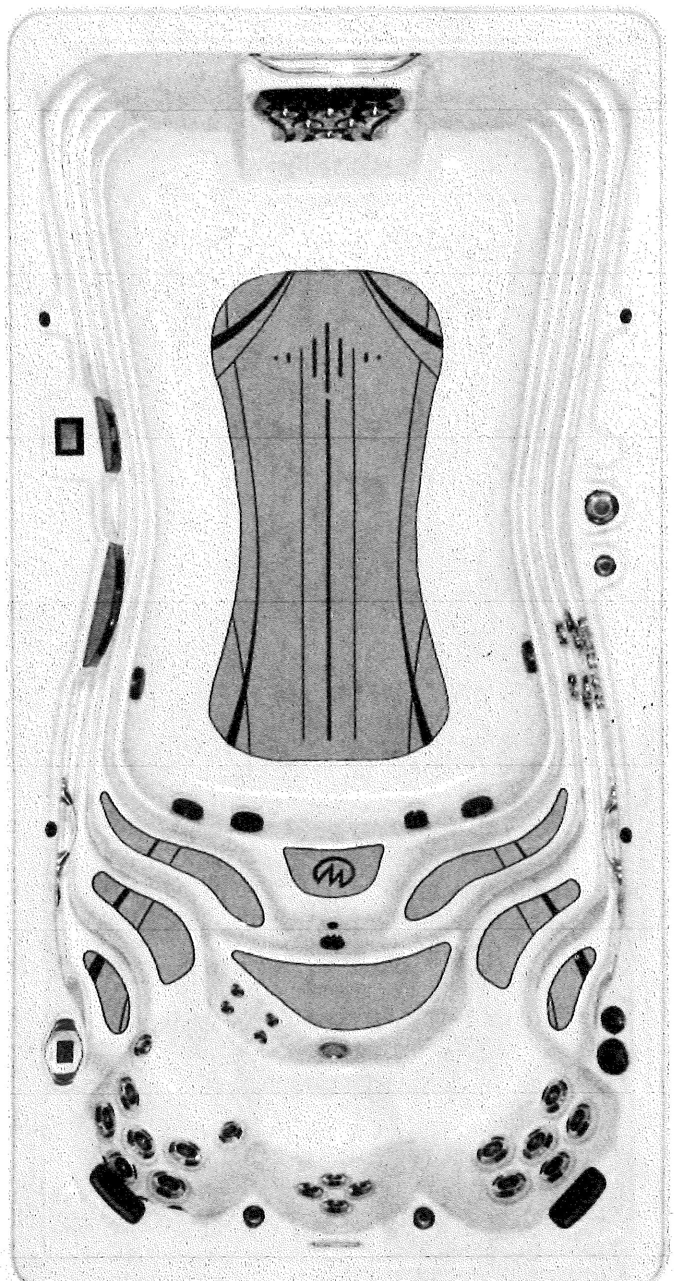
Additional view of yard facing bike path/brook.



Other side of the porch from where the spa would be located.

Challenger 15 D

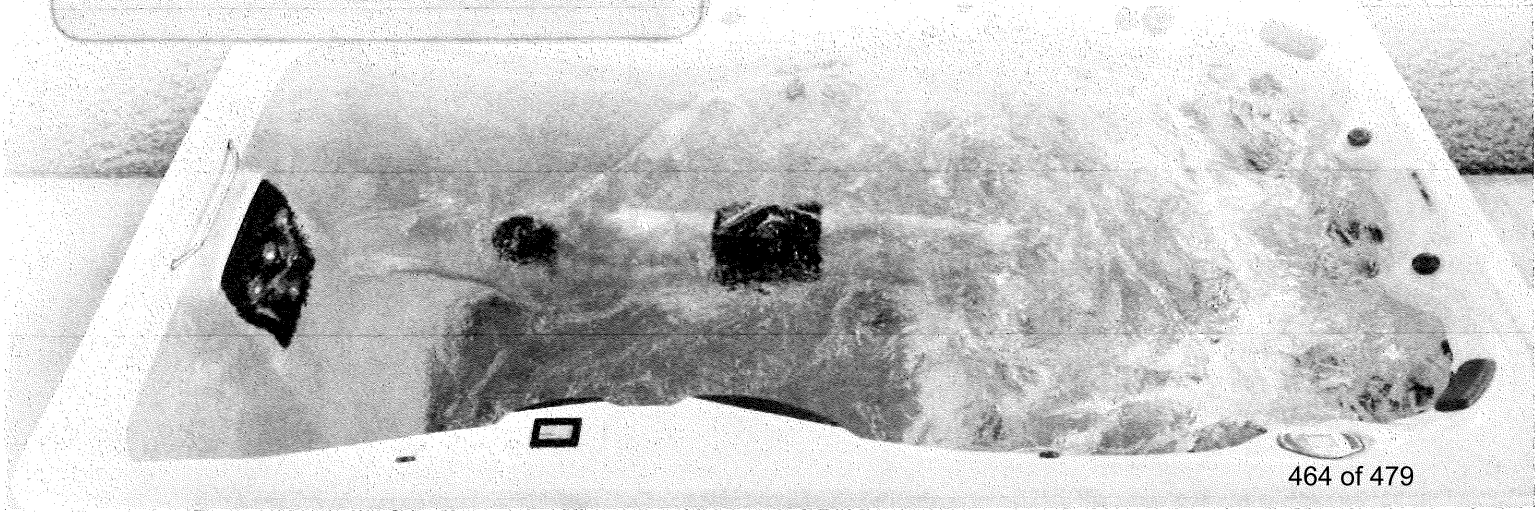
*Elite Performance, Airless VIP, Programmable Speed**



The Challenger 15 D features a large uninhibited area that is perfect for swimming, exercise, and family fun. The Airless VIP Technology enhances swim jet performance, and a variable speed system* allows you to custor the pace. Plus, when it comes to hydrotherapy, rehabilitation, and relaxat nothing compares to the Xtreme Therapy Seat and Xtreme Therapy Cove The smallest footprint of any Challenger model, it's ideal for small backya

Dimensions	180" x 94" (457 cm x 239 cm)
Depth	60" (153 cm)
Water Capacity	1,930 Gallons (7 306 L)
Weight: Dry/Full	2,530 lbs. (1 148 kg) / 19,555 lbs. (8 870 kg)
Propulsion System	Airless VIP Technology
Power Requirement	50 Amp System
Pumps	3
Stainless Steel Jets	45 (Including 6 VIP Jets)
Water Features	5
Ozone System	Standard
Filtration	EcoPur® Charge
LED Lighting	Waterline
Exclusive Features	AquaSpeed VSP™ * StressRelief Neck and Shoulder Seat™ Master Force™ Bio-Magnetic Therapy System
Exclusive Accessories	H2Xercise™ Fitness System
Premium Options	Fusion Air Sound System Wi-Fi Module Mast3rPur™ Water Management System SoftTread™ Nonslip, Comfort Floor System by SwimDek® Wave Light Package
Listing Number	9915

**For International Challenger swim spas, the AquaSpeed VSP system is currently not available. Instead, 3 high flow pumps create a strong, deep, and wide water current from a combination of 7 available speeds.*



Datasets Products Cart

Select products below and then hit "Search Products"

Area of Interest: Map Extent/Geometry

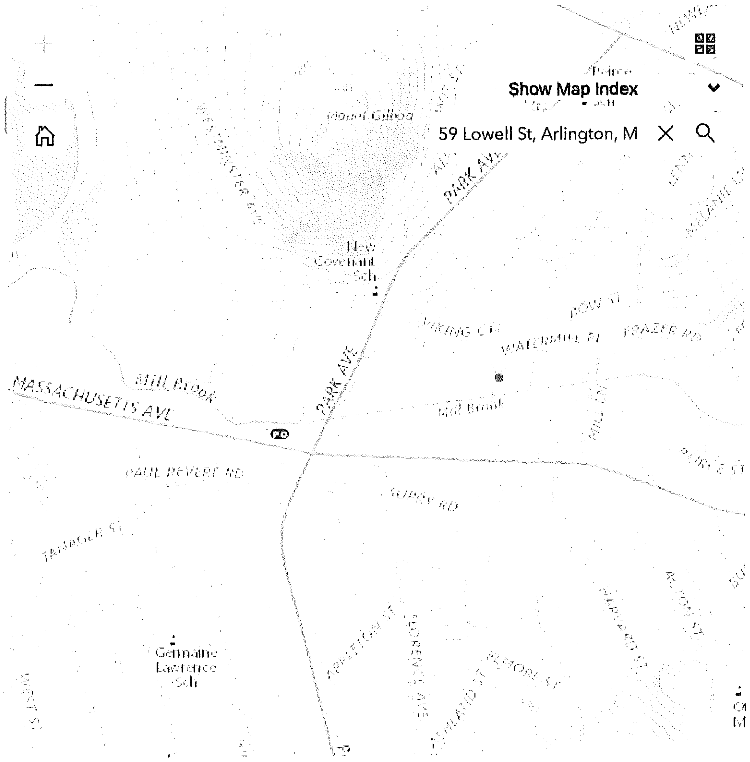
▸Advanced Search

Map

- ☐ US Topo
- ☐ Historical Topographic Maps

Data

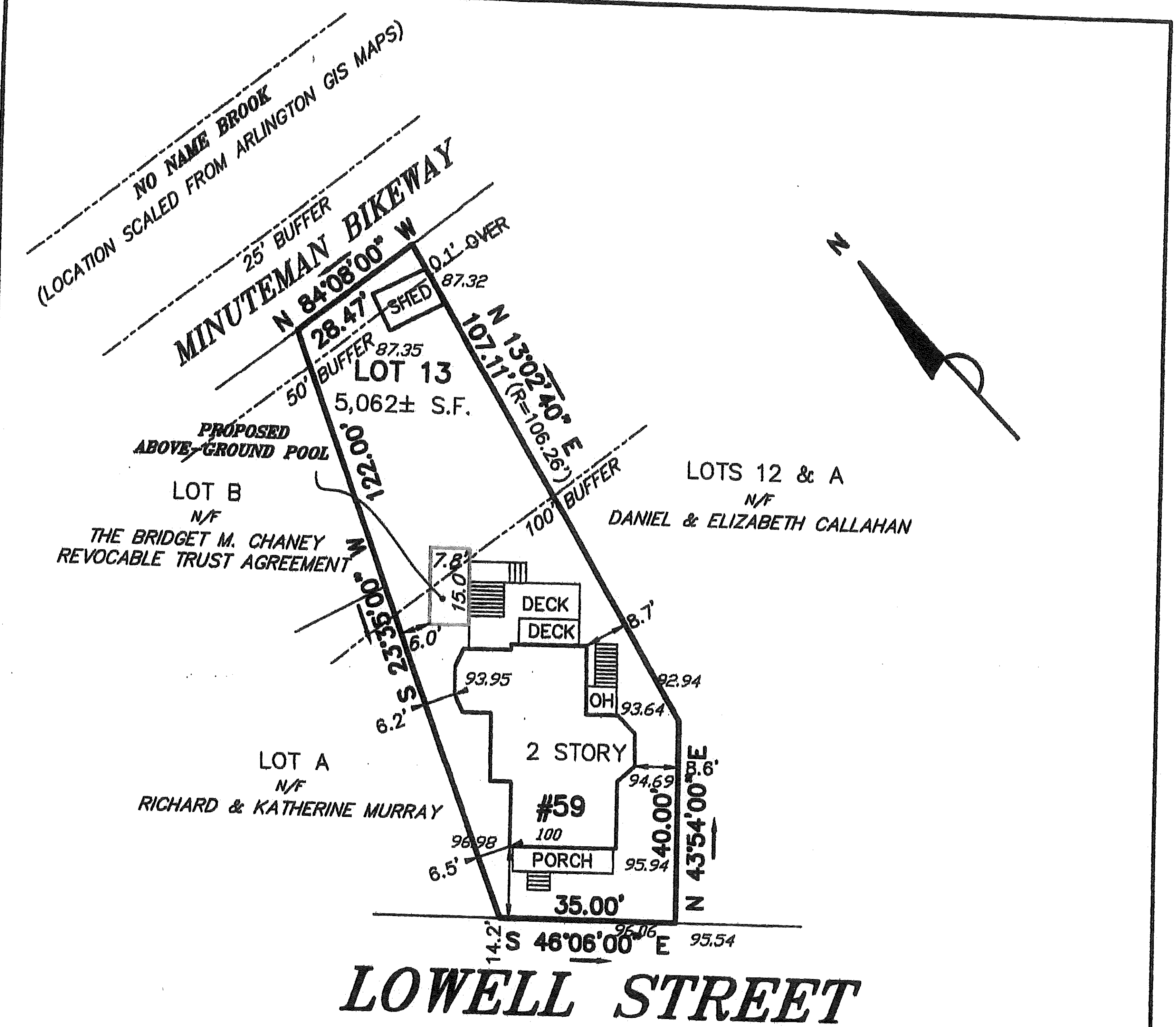
- ☐ Boundaries - National Boundary Dataset
- ☐ Elevation Products (3DEP)
- ☐ Elevation Source Data (3DEP) - Lidar, IfSAR
- ☐ Hydrography (NHDPlus HR, NHD, WBD)
- ☐ Imagery - NAIP Plus (1 meter to 1 foot)
- ☐ Map Indices
- ☐ Names - Geographic Names Information System (GNIS)
- ☐ Small-scale Datasets
- ☐ Structures - National Structures Dataset
- ☐ Topo Map Data and Topo Stylesheet
- ☐ Transportation
- ☐ Woodland Tint
- ☐ Elevation - Topobathy



National Land Cover Database (NLCD) data can be downloaded at the MRLC website.

XY -71.187424°, 42.427486°

600 ft



I HEREBY CERTIFY THAT THE BUILDING IS LOCATED AS SHOWN.

COMMONWEALTH OF MASSACHUSETTS
CLIFFORD E. ROBER
NO. 33189
REGISTERED
PROFESSIONAL LAND SURVEYOR

9/22/20

CLIFFORD E. ROBER, PLS DATE

THIS PLAN MAY HAVE BEEN ALTERED IF THE SIGNATURE IS NOT SIGNED IN BLUE.

OWNER: KATHLEEN MORIARTY

PROPOSED PLOT PLAN
#59 LOWELL STREET
IN
ARLINGTON, MA
(MIDDLESEX COUNTY)

SCALE: 1"= 30' DATE: 9/22/2020

0 30 60 90 ft

ROBER SURVEY
1072A MASSACHUSETTS AVENUE
ARLINGTON, MA 02476
(781) 648-5533

4542PP3.DWG

Office of the Board of Assessors
Robbins Memorial Town Hall
Arlington, MA 02476
(781) 316-3050
Assessors@town.arlington.ma.us

Abutters List

Date: December 08, 2020

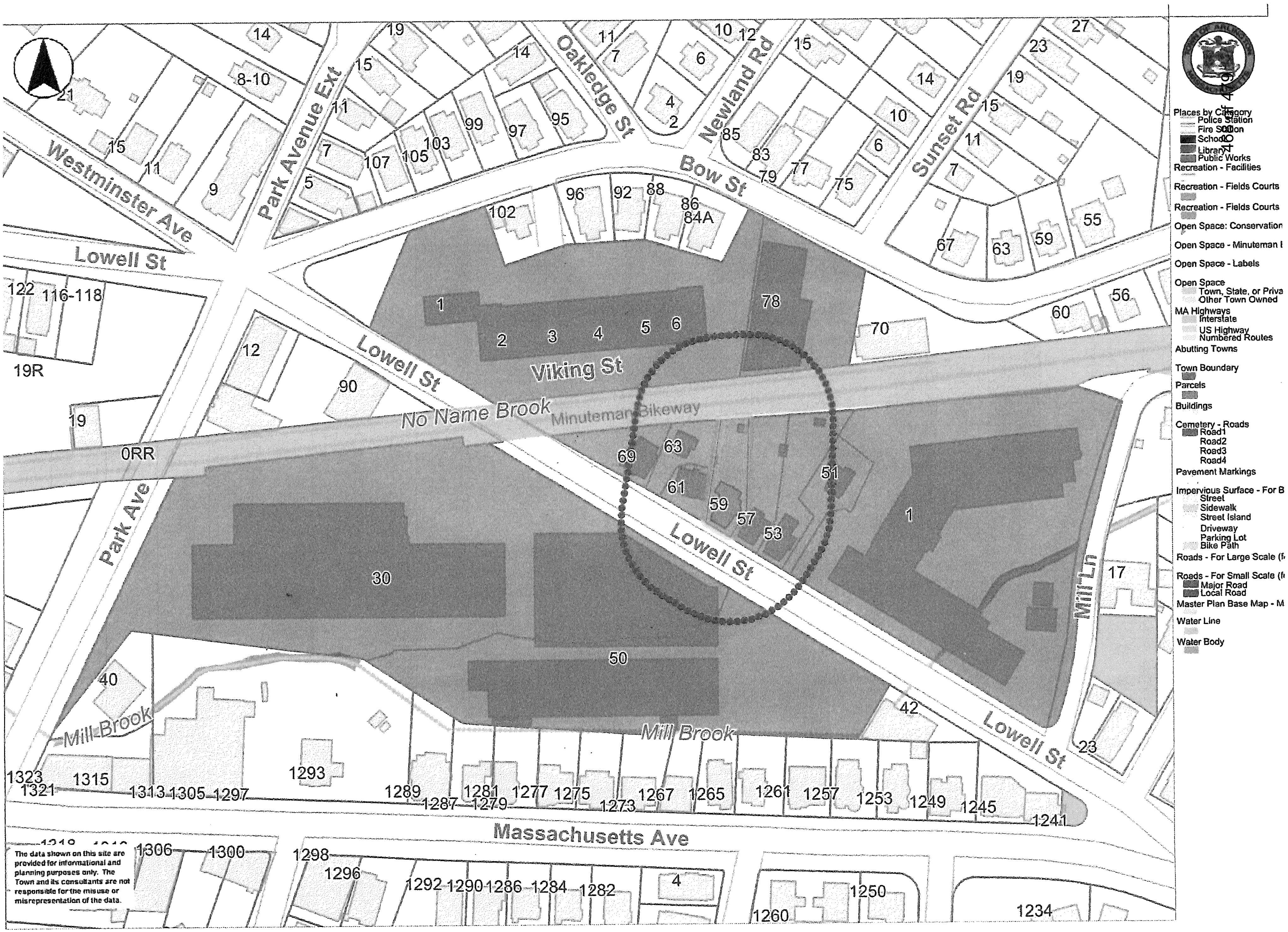
Subject Property Address: 59 LOWELL ST Arlington, MA
Subject Property ID: 58-6-9

Search Distance: 100 Feet - Conservation

The Board of Assessors certifies the names and addresses of requested parties in interest, all abutters to a single parcel within 100 feet.

Kevin P. Feeley
Robert E. Greeley

Board of Assessors



0 200 400 ft

Printed on 12/08/2020 at 11:43 AM

Prop ID: 58.C-1-519
Prop Location: 1 WATERMILL PL UNIT 519 Arlington, MA
Owner: MCSWEENEY MICHAEL & JUDITH
Co-Owner:
Mailing Address:
1 WATERMILL PL #519
ARLINGTON, MA 02476

Prop ID: 58.C-1-520
Prop Location: 1 WATERMILL PL UNIT 520 Arlington, MA
Owner: LEE TSENG-CHUNG ETAL /TRUSTEES
Co-Owner: TSENG-CHUNG LEE TRUST &
Mailing Address:
24 FAIRLAWN LN
LEXINGTON, MA 02420

Prop ID: 58.C-1-521
Prop Location: 1 WATERMILL PL UNIT 521 Arlington, MA
Owner: ONE WATERMILL PLACE LLC
Co-Owner:
Mailing Address:
70 STONE ROAD
WALTHAM, MA 02453

Prop ID: 58.C-1-522
Prop Location: 1 WATERMILL PL UNIT 522 Arlington, MA
Owner: GUTIERREZ SONIA
Co-Owner:
Mailing Address:
1 WATERMILL PL #522
ARLINGTON, MA 02476

Prop ID: 58.C-1-523
Prop Location: 1 WATERMILL PL UNIT 523 Arlington, MA
Owner: DOYLE DANIEL K
Co-Owner:
Mailing Address:
25 HUCKLEBERRY HILL RD
LINCOLN, MA 01773

Prop ID: 58.C-1-524
Prop Location: 1 WATERMILL PL UNIT 524 Arlington, MA
Owner: MARSHALL EDWARD & JAMIE
Co-Owner:
Mailing Address:
1 WATERMILL PL #524
ARLINGTON, MA 02476

Prop ID: 58.C-1-525
Prop Location: 1 WATERMILL PL UNIT 525 Arlington, MA
Owner: LYONS JACQUELINE
Co-Owner:
Mailing Address:
1 WATERMILL PL #525
ARLINGTON, MA 02476

Prop ID: 58.C-1-526
Prop Location: 1 WATERMILL PL UNIT 526 Arlington, MA
Owner: DOWNEY ELIZABETH
Co-Owner:
Mailing Address:
1 WATERMILL PL #526
ARLINGTON, MA 02476

Prop ID: 58.C-1-527
Prop Location: 1 WATERMILL PL UNIT 527 Arlington, MA
Owner: TONG ZHEN
Co-Owner:
Mailing Address:
1 WATERMILL PL #527
ARLINGTON, MA 02474

Prop ID: 58.C-1-528
Prop Location: 1 WATERMILL PL UNIT 528 Arlington, MA
Owner: MOHAN PASUPATHICOIL RAMASWAMY
Co-Owner: MOHAN RADHIKA
Mailing Address:
1 WATERMILL PL #528
ARLINGTON, MA 02474

Prop ID: 59-1-12
Prop Location: 30 PARK AVE Arlington, MA
Owner: 30 PARK AVE ASSOC LLP
Co-Owner:
Mailing Address:
PO BOX 288
ARLINGTON, MA 02476

Prop ID: 59-1-19
Prop Location: 50 LOWELL ST Arlington, MA
Owner: 30 PARK AVE ASSOCIATES LLC
Co-Owner:
Mailing Address:
PO BOX 288
ARLINGTON, MA 02476

Prop ID: 59-3-12.A
Prop Location: 78 BOW ST Arlington, MA
Owner: ZERVOGLOS ANTHONY N--ETAL
Co-Owner: STRATKIS GEORGE
Mailing Address:
16 BRISCOE ST
WOBURN, MA 01801

Prop ID: 59-3-13
Prop Location: 67-69 LOWELL ST Arlington, MA
Owner: KAPOOR KALPANA
Co-Owner:
Mailing Address:
67 LOWELL ST
ARLINGTON, MA 02476

Prop ID: 59-3-4.A
Prop Location: 1-6 VIKING CT Arlington, MA
Owner: JOHNSON SANDRA A-TR--ETAL
Co-Owner: JOHNSON RICHARD A
Mailing Address:
1026 MASS AVENUE SUITE 1
ARLINGTON, MA 02476

Prop ID: 58.C-1-430
Prop Location: 1 WATERMILL PL UNIT 430 Arlington, MA
Owner: BLACKSTONE BARBARA A
Co-Owner:
Mailing Address:
1 WATERMILL PL #430
ARLINGTON, MA 02476

Prop ID: 58.C-1-500
Prop Location: 1 WATERMILL PL UNIT 500 Arlington, MA
Owner: CAFFREY PATRICIA
Co-Owner:
Mailing Address:
1 WATERMILL PL #500
ARLINGTON, MA 02474

Prop ID: 58.C-1-501
Prop Location: 1 WATERMILL PL UNIT 501 Arlington, MA
Owner: DORAN MARY E
Co-Owner:
Mailing Address:
1 WATERMILL PL #501
ARLINGTON, MA 02476

Prop ID: 58.C-1-502
Prop Location: 1 WATERMILL PL UNIT 502 Arlington, MA
Owner: YEE NORMAN N
Co-Owner:
Mailing Address:
1 WATERMILL PL #502
ARLINGTON, MA 02476

Prop ID: 58.C-1-504
Prop Location: 1 WATERMILL PL UNIT 504 Arlington, MA
Owner: SO OI YIN CHEUNG
Co-Owner:
Mailing Address:
21 PATTERSON RD
LEXINGTON, MA 02421

Prop ID: 58.C-1-505
Prop Location: 1 WATERMILL PL UNIT 505 Arlington, MA
Owner: MARINI DONALD
Co-Owner:
Mailing Address:
39 WORCESTER ST #3
BOSTON, MA 02118

Prop ID: 58.C-1-506
Prop Location: 1 WATERMILL PL UNIT 506 Arlington, MA
Owner: DONNELLY TIMOTHY G
Co-Owner:
Mailing Address:
1 WATERMILL PL # 506
ARLINGTON, MA 02476

Prop ID: 58.C-1-507
Prop Location: 1 WATERMILL PL UNIT 507 Arlington, MA
Owner: LYLE JAMES E
Co-Owner:
Mailing Address:
1 WATERMILL PL #507
ARLINGTON, MA 02476

Prop ID: 58.C-1-508
Prop Location: 1 WATERMILL PL UNIT 508 Arlington, MA
Owner: PATEL ALRIK
Co-Owner:
Mailing Address:
1 WATERMILL PL APT 508
ARLINGTON, MA 02476

Prop ID: 58.C-1-509
Prop Location: 1 WATERMILL PL UNIT 509 Arlington, MA
Owner: LUDWIG SUSAN B/TRUSTEE
Co-Owner: SUSAN B LUDWIG LIVING TRUST
Mailing Address:
1 WATERMILL PL #509
ARLINGTON, MA 02476

Prop ID: 58.C-1-510
Prop Location: 1 WATERMILL PL UNIT 510 Arlington, MA
Owner: METALLIDES CYNTHIA/TRUSTEE
Co-Owner: 1 WATERMILL PLACE UNIT 510
Mailing Address:
1 WATERMILL PL #510
ARLINGTON, MA 02476

Prop ID: 58.C-1-512
Prop Location: 1 WATERMILL PL UNIT 512 Arlington, MA
Owner: FENDELANDER LAHN M
Co-Owner:
Mailing Address:
88 BUSH ST
UNIT 4114
SAN JOSE, CA 95126

Prop ID: 58.C-1-514
Prop Location: 1 WATERMILL PL UNIT 514 Arlington, MA
Owner: O REGAN LYNNE A
Co-Owner:
Mailing Address:
1 WATERMILL PL #514
ARLINGTON, MA 02476

Prop ID: 58.C-1-516
Prop Location: 1 WATERMILL PL UNIT 516 Arlington, MA
Owner: GARDINI ORNELLA
Co-Owner:
Mailing Address:
1 WATERMILL PL #516
ARLINGTON, MA 02476

Prop ID: 58.C-1-517
Prop Location: 1 WATERMILL PL UNIT 517 Arlington, MA
Owner: MARVIT MARIAN
Co-Owner:
Mailing Address:
1 WATERMILL PL #517
ARLINGTON, MA 02476

Prop ID: 58.C-1-518
Prop Location: 1 WATERMILL PL UNIT 518 Arlington, MA
Owner: FLEMING ROBERT P
Co-Owner: MASSARO MARK
Mailing Address:
1 WATERMILL PL #518
ARLINGTON, MA 02476

Prop ID: 58.C-1-410
Prop Location: 1 WATERMILL PL UNIT 410 Arlington, MA
Owner: FLAMM BARRY E
Co-Owner:
Mailing Address:
1 WATERMILL PL #410
ARLINGTON, MA 02476

Prop ID: 58.C-1-412
Prop Location: 1 WATERMILL PL UNIT 412 Arlington, MA
Owner: JOYCE MARY TARA
Co-Owner:
Mailing Address:
675 LAKE ST APT 223
OAK PARK, IL 60301

Prop ID: 58.C-1-414
Prop Location: 1 WATERMILL PL UNIT 414 Arlington, MA
Owner: LYNCH RICHARD T
Co-Owner:
Mailing Address:
1 WATERMILL PL #414
ARLINGTON, MA 02476

Prop ID: 58.C-1-415
Prop Location: 1 WATERMILL PL UNIT 415 Arlington, MA
Owner: MORELAND RHOMANCE E TRUSTEE
Co-Owner: REM REALTY TRUST
Mailing Address:
1 WATERMILL PL #415
ARLINGTON, MA 02476

Prop ID: 58.C-1-416
Prop Location: 1 WATERMILL PL UNIT 416 Arlington, MA
Owner: BOUDREAU LORRAINE
Co-Owner:
Mailing Address:
1 WATERMILL PL #416
ARLINGTON, MA 02474

Prop ID: 58.C-1-417
Prop Location: 1 WATERMILL PL UNIT 417 Arlington, MA
Owner: PRENDERGAST MICHAEL D ETAL
Co-Owner: TRS/ PRENDERGAST FAMILY TRUST
Mailing Address:
785 S GAYLORD ST
DENVER, CO 80209-4629

Prop ID: 58.C-1-418
Prop Location: 1 WATERMILL PL UNIT 418 Arlington, MA
Owner: MC DERMOTT MARIAN D
Co-Owner:
Mailing Address:
1 WATERMILL PL #418
ARLINGTON, MA 02476

Prop ID: 58.C-1-419
Prop Location: 1 WATERMILL PL UNIT 419 Arlington, MA
Owner: TOSTI ALLAN & BARBARA A
Co-Owner:
Mailing Address:
1 WATERMILL PL #419
ARLINGTON, MA 02476

Prop ID: 58.C-1-420
Prop Location: 1 WATERMILL PL UNIT 420 Arlington, MA
Owner: KIM DAVID E TRUSTEE
Co-Owner: PARK CHRISTINE H TRUSTEE
Mailing Address:
28631 BRECKENRIDGE DRIVE
LAGUNA NIGUEL, CA 92677

Prop ID: 58.C-1-421
Prop Location: 1 WATERMILL PL UNIT 421 Arlington, MA
Owner: JABR REEM Z
Co-Owner:
Mailing Address:
1 WATERMILL PL # 421
ARLINGTON, MA 02476

Prop ID: 58.C-1-423
Prop Location: 1 WATERMILL PL UNIT 423 Arlington, MA
Owner: SCHNEIDER MARJORIE L
Co-Owner:
Mailing Address:
1 WATERMILL PL #423
ARLINGTON, MA 02476

Prop ID: 58.C-1-424
Prop Location: 1 WATERMILL PL UNIT 424 Arlington, MA
Owner: LIN YAN-TING
Co-Owner: CHEN YIAN
Mailing Address:
1 WATERMILL PL UNIT 424
ARLINGTON, MA 02476

Prop ID: 58.C-1-425
Prop Location: 1 WATERMILL PL UNIT 425 Arlington, MA
Owner: STACK MARY
Co-Owner: HOCHMUTH CHARLES
Mailing Address:
16 LOCKE ST
ARLINGTON, MA 02476

Prop ID: 58.C-1-426
Prop Location: 1 WATERMILL PL UNIT 426 Arlington, MA
Owner: GOPALAN MADHAVAN S
Co-Owner:
Mailing Address:
3104 ARGENT PATH
ELLICOTT CITY, MD 21043

Prop ID: 58.C-1-427
Prop Location: 1 WATERMILL PL UNIT 427 Arlington, MA
Owner: GERSHMAN RACHEL E
Co-Owner:
Mailing Address:
1 WATERMILL PL #427
ARLINGTON, MA 02476

Prop ID: 58.C-1-428
Prop Location: 1 WATERMILL PL UNIT 428 Arlington, MA
Owner: OLSZEWSKI ANGELA M
Co-Owner:
Mailing Address:
1 WATERMILL PL #428
ARLINGTON, MA 02476

Prop ID: 58.C-1-320
Prop Location: 1 WATERMILL PL UNIT 320 Arlington, MA
Owner: HENIZE BEATRIX
Co-Owner:
Mailing Address:
1 WATERMILL PL #320
ARLINGTON, MA 02476

Prop ID: 58.C-1-321
Prop Location: 1 WATERMILL PL UNIT 321 Arlington, MA
Owner: KARGER EVA R
Co-Owner:
Mailing Address:
1 WATERMILL PL #321
ARLINGTON, MA 02476

Prop ID: 58.C-1-322
Prop Location: 1 WATERMILL PL UNIT 322 Arlington, MA
Owner: GRIFFIN BONNIE M
Co-Owner:
Mailing Address:
1 WATERMILL PL #322
ARLINGTON, MA 02476

Prop ID: 58.C-1-323
Prop Location: 1 WATERMILL PL UNIT 323 Arlington, MA
Owner: LEFEBVRE LEONARD S
Co-Owner:
Mailing Address:
1 WATERMILL PL #323
ARLINGTON, MA 02476

Prop ID: 58.C-1-324
Prop Location: 1 WATERMILL PL UNIT 324 Arlington, MA
Owner: WHALEN FRANCIS T
Co-Owner:
Mailing Address:
1 WATERMILL PL #324
ARLINGTON, MA 02476

Prop ID: 58.C-1-325
Prop Location: 1 WATERMILL PL UNIT 325 Arlington, MA
Owner: MAKKI SALMAN MUHYEDIN ETAL
Co-Owner: TRS/ MAKKIS LIVING TRUST
Mailing Address:
347 CALLE PUEBLO
SAN CLEMENTE, CA 92672

Prop ID: 58.C-1-326
Prop Location: 1 WATERMILL PL UNIT 326 Arlington, MA
Owner: MOJAHED SHAHRIYAR
Co-Owner:
Mailing Address:
8 THORNBERRY RD
WINCHESTER, MA 01890

Prop ID: 58.C-1-328
Prop Location: 1 WATERMILL PL UNIT 328 Arlington, MA
Owner: BUSA DARLENE A
Co-Owner:
Mailing Address:
1 WATERMILL PL #328
ARLINGTON, MA 02476

Prop ID: 58.C-1-330
Prop Location: 1 WATERMILL PL UNIT 330 Arlington, MA
Owner: SULLIVAN TERRANCE
Co-Owner:
Mailing Address:
1 WATERMILL PL #330
ARLINGTON, MA 02476

Prop ID: 58.C-1-401
Prop Location: 1 WATERMILL PL UNIT 401 Arlington, MA
Owner: SERADERIAN VATCHE
Co-Owner:
Mailing Address:
1 SCHOOLHOUSE LN
LEXINGTON, MA 02421

Prop ID: 58.C-1-402
Prop Location: 1 WATERMILL PL UNIT 402 Arlington, MA
Owner: FEHLAN MAUREEN E
Co-Owner:
Mailing Address:
1 WATERMILL PL #402
ARLINGTON, MA 02476

Prop ID: 58.C-1-404
Prop Location: 1 WATERMILL PL UNIT 404 Arlington, MA
Owner: MATSUI HISAKO
Co-Owner:
Mailing Address:
1 WATERMILL PL #404
ARLINGTON, MA 02476

Prop ID: 58.C-1-405
Prop Location: 1 WATERMILL PL UNIT 405 Arlington, MA
Owner: ODONNELL LORRAINE
Co-Owner:
Mailing Address:
1 WATERMILL PL #405
ARLINGTON, MA 02476

Prop ID: 58.C-1-406
Prop Location: 1 WATERMILL PL UNIT 406 Arlington, MA
Owner: LIARDONI ALBERT L
Co-Owner:
Mailing Address:
1 WATERMILL PL #406
ARLINGTON, MA 02476

Prop ID: 58.C-1-407
Prop Location: 1 WATERMILL PL UNIT 407 Arlington, MA
Owner: OSOFSKY DAVID
Co-Owner:
Mailing Address:
1 WATERMILL PL #407
ARLINGTON, MA 02476

Prop ID: 58.C-1-409
Prop Location: 1 WATERMILL PL UNIT 409 Arlington, MA
Owner: ZASLAVSKY PAUL/ LIFE ESTATE
Co-Owner: SHPIRT ANNA/ LIFE ESTATE
Mailing Address:
1 WATERMILL PL #409
ARLINGTON, MA 02476

Prop ID: 58.C-1-302
Prop Location: 1 WATERMILL PL UNIT 302 Arlington, MA
Owner: HOCHMUTH CHARLES H
Co-Owner: STACK MARY G
Mailing Address:
16 LOCKE ST
ARLINGTON, MA 02476

Prop ID: 58.C-1-304
Prop Location: 1 WATERMILL PL UNIT 304 Arlington, MA
Owner: TOBIN ALICE P
Co-Owner:
Mailing Address:
1 WATERMILL PL
UNIT 304
ARLINGTON, MA 02476

Prop ID: 58.C-1-305
Prop Location: 1 WATERMILL PL UNIT 305 Arlington, MA
Owner: BUSH ARTHUR H/ TRUSTEE
Co-Owner: ARTHUR H BUSH TRUST
Mailing Address:
1 WATERMILL PL #305
ARLINGTON, MA 02476

Prop ID: 58.C-1-306
Prop Location: 1 WATERMILL PL UNIT 306 Arlington, MA
Owner: LENNOX MIRIAN C
Co-Owner: WORTHINGTON ANNABEL S
Mailing Address:
1 WATERMILL PL #306
ARLINGTON, MA 02476

Prop ID: 58.C-1-307
Prop Location: 1 WATERMILL PL UNIT 307 Arlington, MA
Owner: GAVIN TERRI M
Co-Owner:
Mailing Address:
1 WATERMILL PL #307
ARLINGTON, MA 02476

Prop ID: 58.C-1-308
Prop Location: 1 WATERMILL PL UNIT 308 Arlington, MA
Owner: PETERSON JORDAN G
Co-Owner:
Mailing Address:
1 WATERMILL PL UNIT 308
ARLINGTON, MA 02476

Prop ID: 58.C-1-309
Prop Location: 1 WATERMILL PL UNIT 309 Arlington, MA
Owner: PRESSMAN PEGGY E
Co-Owner:
Mailing Address:
1 WATERMILL PL #309
ARLINGTON, MA 02476

Prop ID: 58.C-1-310
Prop Location: 1 WATERMILL PL UNIT 310 Arlington, MA
Owner: LERMAN SCOTT M
Co-Owner:
Mailing Address:
1 WATERMILL PL #310
ARLINGTON, MA 02476

Prop ID: 58.C-1-311
Prop Location: 1 WATERMILL PL UNIT 311 Arlington, MA
Owner: BACZKOWSKI DANIEL & ROSEMARIE
Co-Owner:
Mailing Address:
1 WATERMILL PL #311
ARLINGTON, MA 02476

Prop ID: 58.C-1-312
Prop Location: 1 WATERMILL PL UNIT 312 Arlington, MA
Owner: BOYLE BARBARA
Co-Owner:
Mailing Address:
109 GRAY STREET
ARLINGTON, MA 02476

Prop ID: 58.C-1-314
Prop Location: 1 WATERMILL PL UNIT 314 Arlington, MA
Owner: QUIGLEY MARY A
Co-Owner:
Mailing Address:
1 WATERMILL PL #314
ARLINGTON, MA 02476

Prop ID: 58.C-1-315
Prop Location: 1 WATERMILL PL UNIT 315 Arlington, MA
Owner: OREILLY PETER J
Co-Owner:
Mailing Address:
1 WATERMILL PL #315
ARLINGTON, MA 02476

Prop ID: 58.C-1-316
Prop Location: 1 WATERMILL PL UNIT 316 Arlington, MA
Owner: FISHER CHRISTINA/ TRUSTEE
Co-Owner: ANNE M DIMAURO IRREVOCABLE TR
Mailing Address:
1 WATERMILL PL #316
ARLINGTON, MA 02476

Prop ID: 58.C-1-317
Prop Location: 1 WATERMILL PL UNIT 317 Arlington, MA
Owner: SINGER BETH
Co-Owner:
Mailing Address:
1 WATERMILL PL #317
ARLINGTON, MA 02476

Prop ID: 58.C-1-318
Prop Location: 1 WATERMILL PL UNIT 318 Arlington, MA
Owner: COOK MELISSA K
Co-Owner:
Mailing Address:
1 WATERMILL PL #318
ARLINGTON, MA 02476

Prop ID: 58.C-1-319
Prop Location: 1 WATERMILL PL UNIT 319 Arlington, MA
Owner: KEELER MARY L
Co-Owner:
Mailing Address:
95 CLARKS FARM RD
CARLISLE, MA 01741

Prop ID: 58.C-1-215
Prop Location: 1 WATERMILL PL UNIT 215 Arlington, MA
Owner: FREINER KENNETH OLIVER JR
Co-Owner: FREINER HOLLY T
Mailing Address:
1 WATERMILL PL #215
ARLINGTON, MA 02474

Prop ID: 58.C-1-216
Prop Location: 1 WATERMILL PL UNIT 216 Arlington, MA
Owner: SCHRAMM ALLAN N & MARGARET
Co-Owner:
Mailing Address:
1 WATERMILL PL #216
ARLINGTON, MA 02476

Prop ID: 58.C-1-217
Prop Location: 1 WATERMILL PL UNIT 217 Arlington, MA
Owner: LAPORTA CARMEN G
Co-Owner: LAPORTA MONAGHAN JOAN
Mailing Address:
1 WATERMILL PL #217
ARLINGTON, MA 02476

Prop ID: 58.C-1-218
Prop Location: 1 WATERMILL PL UNIT 218 Arlington, MA
Owner: VOZZELLA EMMA L
Co-Owner:
Mailing Address:
1 WATERMILL PL #218
ARLINGTON, MA 02476

Prop ID: 58.C-1-219
Prop Location: 1 WATERMILL PL UNIT 219 Arlington, MA
Owner: GAVRILLES BESSIE
Co-Owner: LIFE ESTATE
Mailing Address:
1 WATERMILL PL #219
ARLINGTON, MA 02476

Prop ID: 58.C-1-220
Prop Location: 1 WATERMILL PL UNIT 220 Arlington, MA
Owner: BUNTROCK REBECCA M/TRUSTEE
Co-Owner: MARK BUNTROCK REALTY TRUST
Mailing Address:
1 WATERMILL PL #220
ARLINGTON, MA 02476

Prop ID: 58.C-1-221
Prop Location: 1 WATERMILL PL UNIT 221 Arlington, MA
Owner: LIEPKALNS ERIKA A
Co-Owner:
Mailing Address:
1 WATERMILL PL #221
ARLINGTON, MA 02476

Prop ID: 58.C-1-222
Prop Location: 1 WATERMILL PL UNIT 222 Arlington, MA
Owner: PATKI ABHAY H
Co-Owner:
Mailing Address:
1 WATERMILL PL #222
ARLINGTON, MA 02476

Prop ID: 58.C-1-223
Prop Location: 1 WATERMILL PL UNIT 223 Arlington, MA
Owner: CHAO ALAN I
Co-Owner:
Mailing Address:
1 WATERMILL PL #223
ARLINGTON, MA 02476

Prop ID: 58.C-1-224
Prop Location: 1 WATERMILL PL UNIT 224 Arlington, MA
Owner: BEAUCHESNE DIANE L
Co-Owner:
Mailing Address:
219 LOWELL ST
METHUEN, MA 01844

Prop ID: 58.C-1-225
Prop Location: 1 WATERMILL PL UNIT 225 Arlington, MA
Owner: MENSAH ROBERT D
Co-Owner:
Mailing Address:
1 WATERMILL PL #225
ARLINGTON, MA 02476

Prop ID: 58.C-1-226
Prop Location: 1 WATERMILL PL UNIT 226 Arlington, MA
Owner: UCCELLO MICHAEL
Co-Owner:
Mailing Address:
1 WATERMILL PL #226
ARLINGTON, MA 02476

Prop ID: 58.C-1-228
Prop Location: 1 WATERMILL PL UNIT 228 Arlington, MA
Owner: SILVA THERESA/ TRUSTEE
Co-Owner: THERESA SILVA FAMILY TRUST
Mailing Address:
1 WATERMILL PL #228
ARLINGTON, MA 02476

Prop ID: 58.C-1-230
Prop Location: 1 WATERMILL PL UNIT 230 Arlington, MA
Owner: HARTIG DAVID
Co-Owner:
Mailing Address:
1 WATERMILL PL UNIT 230
ARLINGTON, MA 02474

Prop ID: 58.C-1-3
Prop Location: 1 WATERMILL PL UNIT 3 Arlington, MA
Owner: BRADLEY VINCENT
Co-Owner:
Mailing Address:
1 WATERMILL PL #3
ARLINGTON, MA 02476

Prop ID: 58.C-1-301
Prop Location: 1 WATERMILL PL UNIT 301 Arlington, MA
Owner: BILOW YAKOV
Co-Owner:
Mailing Address:
1 WATERMILL PL #301
ARLINGTON, MA 02476

Prop ID: 58.C-1-126
Prop Location: 1 WATERMILL PL UNIT 126 Arlington, MA
Owner: MIGAUSKY MARJORIE R
Co-Owner:
Mailing Address:
1 WATERMILL PL #126
ARLINGTON, MA 02476

Prop ID: 58.C-1-128
Prop Location: 1 WATERMILL PL UNIT 128 Arlington, MA
Owner: MCKENZIE J STEWART & RICKI L/
Co-Owner: TRS/ MCKENZIE REVOCABLE TRUST
Mailing Address:
81 WILLOW AVE
SOMERVILLE, MA 02144

Prop ID: 58.C-1-130
Prop Location: 1 WATERMILL PL UNIT 130 Arlington, MA
Owner: STANLEY STEPHANIE M & WILLIAM
Co-Owner:
Mailing Address:
1 WATERMILL PL #130
ARLINGTON, MA 02476

Prop ID: 58.C-1-2
Prop Location: 1 WATERMILL PL UNIT 2 Arlington, MA
Owner: O SULLIVAN COLIN/KATHERINE R
Co-Owner:
Mailing Address:
1 WATERMILL PL #2
ARLINGTON, MA 02476

Prop ID: 58.C-1-201
Prop Location: 1 WATERMILL PL UNIT 201 Arlington, MA
Owner: COCONCEA PHILIP
Co-Owner: DAVIDSON CHARLOTTE
Mailing Address:
1 WATERMILL PL #201
ARLINGTON, MA 02476

Prop ID: 58.C-1-202
Prop Location: 1 WATERMILL PL UNIT 202 Arlington, MA
Owner: D SOUZA ERIC B/ TRUSTEE
Co-Owner: ERIC B D SOUZA 2011 REVOCABLE
Mailing Address:
80 RUBLEE STREET
ARLINGTON, MA 02476

Prop ID: 58.C-1-204
Prop Location: 1 WATERMILL PL UNIT 204 Arlington, MA
Owner: FRATIC JOSEPH JR
Co-Owner:
Mailing Address:
1 WATERMILL PL #204
ARLINGTON, MA 02474

Prop ID: 58.C-1-205
Prop Location: 1 WATERMILL PL UNIT 205 Arlington, MA
Owner: GIBBONS JOAN F/TRUSTEE
Co-Owner: JOAN F GIBBONS REVOCABLE TRUST
Mailing Address:
1 WATERMILL PL #205
ARLINGTON, MA 02476

Prop ID: 58.C-1-206
Prop Location: 1 WATERMILL PL UNIT 206 Arlington, MA
Owner: NARASIMHAN KAMALA
Co-Owner:
Mailing Address:
31 CHATHAM STREET
ARLINGTON, MA 02476

Prop ID: 58.C-1-207
Prop Location: 1 WATERMILL PL UNIT 207 Arlington, MA
Owner: DUBE CATHERINE/ TRUSTEE
Co-Owner: DUBE LIVING TRUST
Mailing Address:
1 WATERMILL PL #207
ARLINGTON, MA 02476

Prop ID: 58.C-1-208
Prop Location: 1 WATERMILL PL UNIT 208 Arlington, MA
Owner: WINSTON JENNIFER L
Co-Owner:
Mailing Address:
1 WATERMILL PL #208
ARLINGTON, MA 02476

Prop ID: 58.C-1-209
Prop Location: 1 WATERMILL PL UNIT 209 Arlington, MA
Owner: UCCELLO PAUL & MICHAEL/TRS
Co-Owner: WALNUT TERRACE PROPERTY TRUST
Mailing Address:
1 WATERMILL PL 209
ARLINGTON, MA 02474

Prop ID: 58.C-1-210
Prop Location: 1 WATERMILL PL UNIT 210 Arlington, MA
Owner: YANG SHENGYUAN &
Co-Owner: LONG LIJUAN
Mailing Address:
1 WATERMILL PL #210
ARLINGTON, MA 02476

Prop ID: 58.C-1-211
Prop Location: 1 WATERMILL PL UNIT 211 Arlington, MA
Owner: GREENE SHERRY A
Co-Owner:
Mailing Address:
1 WATERMILL PL #211
ARLINGTON, MA 02476

Prop ID: 58.C-1-212
Prop Location: 1 WATERMILL PL UNIT 212 Arlington, MA
Owner: WEBBER SUSAN D
Co-Owner:
Mailing Address:
1 WATERMILL PL # 212
ARLINGTON, MA 02476

Prop ID: 58.C-1-214
Prop Location: 1 WATERMILL PL UNIT 214 Arlington, MA
Owner: LEAL RAFAELA
Co-Owner:
Mailing Address:
1 WATERMILL PL # 214
ARLINGTON, MA 02476

Prop ID: 58.C-1-109
Prop Location: 1 WATERMILL PL UNIT 109 Arlington, MA
Owner: SCIUCCO FIORE A
Co-Owner:
Mailing Address:
1 WATERMILL PL #109
ARLINGTON, MA 02476

Prop ID: 58.C-1-110
Prop Location: 1 WATERMILL PL UNIT 110 Arlington, MA
Owner: BIRD DAVID G
Co-Owner:
Mailing Address:
1 WATERMILL PL # 110
ARLINGTON, MA 02476

Prop ID: 58.C-1-111
Prop Location: 1 WATERMILL PL UNIT 111 Arlington, MA
Owner: FRENIER SARA A
Co-Owner:
Mailing Address:
1 WATERMILL PL #111
ARLINGTON, MA 02476

Prop ID: 58.C-1-112
Prop Location: 1 WATERMILL PL UNIT 112 Arlington, MA
Owner: CHELIKANI RAHUL &
Co-Owner: KOTAGIRI NAMRATA
Mailing Address:
1 WATERMILL PL #112
ARLINGTON, MA 02476

Prop ID: 58.C-1-114
Prop Location: 1 WATERMILL PL UNIT 114 Arlington, MA
Owner: HONTON STEPHEN P
Co-Owner: PETERSCHMITT MARIA JUDITH
Mailing Address:
49 PAYSON TERR
BELMONT, MA 02478

Prop ID: 58.C-1-115
Prop Location: 1 WATERMILL PL UNIT 115 Arlington, MA
Owner: LECCACORVI KRISTEN
Co-Owner: LOPEZ RICARDO
Mailing Address:
1 WATERMILL PL #115
ARLINGTON, MA 02474

Prop ID: 58.C-1-116
Prop Location: 1 WATERMILL PL UNIT 116 Arlington, MA
Owner: LYONS MARY T
Co-Owner:
Mailing Address:
1 WATERMILL PL #116
ARLINGTON, MA 02476

Prop ID: 58.C-1-117
Prop Location: 1 WATERMILL PL UNIT 117 Arlington, MA
Owner: KOUL AJAY
Co-Owner:
Mailing Address:
17 PHEASANT LN
LEXINGTON, MA 02421

Prop ID: 58.C-1-118
Prop Location: 1 WATERMILL PL UNIT 118 Arlington, MA
Owner: LOPES MARIETTA
Co-Owner:
Mailing Address:
1 WATERMILL PL #118
ARLINGTON, MA 02476

Prop ID: 58.C-1-119
Prop Location: 1 WATERMILL PL UNIT 119 Arlington, MA
Owner: DOHERTY JOHN J & ANN/LIFE ESTA
Co-Owner:
Mailing Address:
1 WATERMILL PL #119
ARLINGTON, MA 02476

Prop ID: 58.C-1-120
Prop Location: 1 WATERMILL PL UNIT 120 Arlington, MA
Owner: RAUCHWARGER JUDITH
Co-Owner:
Mailing Address:
1 WATERMILL PL #120
ARLINGTON, MA 02476

Prop ID: 58.C-1-121
Prop Location: 1 WATERMILL PL UNIT 121 Arlington, MA
Owner: BROOK REALTY LLC
Co-Owner:
Mailing Address:
1 WATERMILL PL #121
ARLINGTON, MA 02476

Prop ID: 58.C-1-122
Prop Location: 1 WATERMILL PL UNIT 122 Arlington, MA
Owner: PETROWSKY JOAN
Co-Owner:
Mailing Address:
1 WATERMILL PL #122
ARLINGTON, MA 02476

Prop ID: 58.C-1-123
Prop Location: 1 WATERMILL PL UNIT 123 Arlington, MA
Owner: GIAUQUE MICHAEL & ANN
Co-Owner:
Mailing Address:
1 WATERMILL PL #123
ARLINGTON, MA 02476

Prop ID: 58.C-1-124
Prop Location: 1 WATERMILL PL UNIT 124 Arlington, MA
Owner: MUGNAI DONALD J
Co-Owner:
Mailing Address:
1 WATERMILL PL #124
ARLINGTON, MA 02476

Prop ID: 58.C-1-125
Prop Location: 1 WATERMILL PL UNIT 125 Arlington, MA
Owner: KELLEHER MARIA D
Co-Owner: ANTHONY REBECCA H
Mailing Address:
1 WATERMILL PL #125
ARLINGTON, MA 02476

Abutters List
Date: December 08, 2020
Subject Property Address: 59 LOWELL ST Arlington, MA
Subject Property ID: 58-6-9
Search Distance: 100 Feet

Prop ID: 58-6-9
Prop Location: 59 LOWELL ST Arlington, MA
Owner: MORIARTY KATHLEEN M
Co-Owner:
Mailing Address:
59 LOWELL ST
ARLINGTON, MA 02476

Prop ID: 58-6-10
Prop Location: 61 LOWELL ST Arlington, MA
Owner: MURRAY RICHARD & KATHERINE
Co-Owner:
Mailing Address:
61 LOWELL ST
ARLINGTON, MA 02476

Prop ID: 58-6-11.A
Prop Location: 63 LOWELL ST Arlington, MA
Owner: CHANEY BRIDGET M/TRUSTEE
Co-Owner: BRIDGET CHANEY TRUST
Mailing Address:
13780 JULIAS WAY UNIT 1013
FORT MYERS, FL 33919

Prop ID: 58-6-5.A
Prop Location: 51 LOWELL ST Arlington, MA
Owner: SITTEL CORNELIA
Co-Owner:
Mailing Address:
51 LOWELL ST
ARLINGTON, MA 02476

Prop ID: 58-6-6
Prop Location: 53 LOWELL ST Arlington, MA
Owner: WHITE ALEKSANDR J & LAURA F
Co-Owner:
Mailing Address:
53 LOWELL ST
ARLINGTON, MA 02476

Prop ID: 58-6-7
Prop Location: 57 LOWELL ST Arlington, MA
Owner: CALLAHAN DANIEL J IV
Co-Owner: CALLAHAN ELIZABETH
Mailing Address:
57 LOWELL ST
ARLINGTON, MA 02476

Prop ID: 58.C-1-1
Prop Location: 1 WATERMILL PL UNIT 1 Arlington, MA
Owner: ALEXANDER FREDERICK J/TRUSTEE
Co-Owner: C.A. NOMINEE TRUST
Mailing Address:
1 WATERMILL PL #1
ARLINGTON, MA 02476

Prop ID: 58.C-1-101
Prop Location: 1 WATERMILL PL UNIT 101 Arlington, MA
Owner: SHEPARDSON KEVIN W & NINA E
Co-Owner:
Mailing Address:
1 WATERMILL PL #101
ARLINGTON, MA 02476

Prop ID: 58.C-1-102
Prop Location: 1 WATERMILL PL UNIT 102 Arlington, MA
Owner: CUSICK PETER J
Co-Owner:
Mailing Address:
1 WATERMILL PL #102
ARLINGTON, MA 02476

Prop ID: 58.C-1-104
Prop Location: 1 WATERMILL PL UNIT 104 Arlington, MA
Owner: RANGANATHAN RAJESHWARI
Co-Owner: SRIRAMAN VENKATARAMAN
Mailing Address:
103 BRAND ST
ARLINGTON, MA 02474

Prop ID: 58.C-1-105
Prop Location: 1 WATERMILL PL UNIT 105 Arlington, MA
Owner: KEZERIAN KAREN A/TRUSTEE
Co-Owner: MADDEN SUSAN M/TRUSTEE
Mailing Address:
1 WATERMILL PL #105
ARLINGTON, MA 02476

Prop ID: 58.C-1-106
Prop Location: 1 WATERMILL PL UNIT 106 Arlington, MA
Owner: MULLANE-ROBINSON KAREN
Co-Owner: MULLANE THOMAS P
Mailing Address:
77 HERITAGE HILL RD
WINDHAM, NH 03087

Prop ID: 58.C-1-107
Prop Location: 1 WATERMILL PL UNIT 107 Arlington, MA
Owner: MINSON RYAN T & JULIA
Co-Owner:
Mailing Address:
22 LENNON RD
ARLINGTON, MA 02474

Prop ID: 58.C-1-108
Prop Location: 1 WATERMILL PL UNIT 108 Arlington, MA
Owner: REIS MANUEL R & TERESA C
Co-Owner:
Mailing Address:
2 VINE BROOK WAY
UNIT 108
WOBURN, MA 01801

59 Lowell Street, Proposed Swim Spa

Blue tarp marks proposed spa location.

Yard facing brook

Additional view of yard facing bike path/brook.

Other side of the porch from where the spa would be located.